Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL, AND OTHER IMPROVEMENTS

VOLUME XII. NEW-YORK, NOVEMBER 15, 1856. NUMBER 10.

THE

Scientific American,

PUBLISHED WEEKLY

At 128 Fulton street, N. Y. (Sun Buildings.)

BY MUNN & CO.

O. D. MUNN, S. H. WALES, A. E. BEACH.

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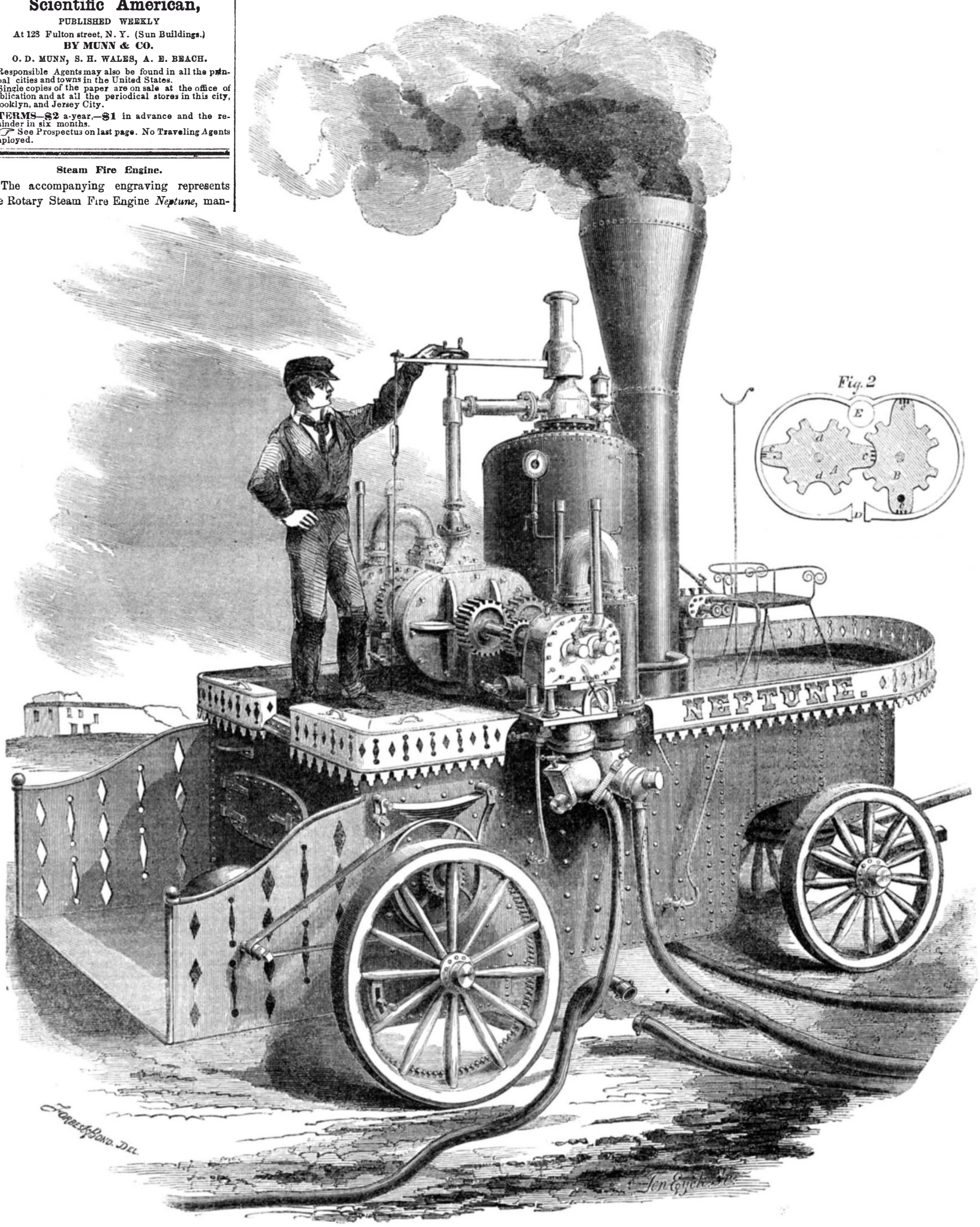
THE NEW STEAM FIRE ENGINE.



Steam Fire Engine.

The accompanying engraving represents the Rotary Steam Fire Engine *Neptune*, manufactured by Messrs. Silsby, Mynderse & Co., of the "Island Works," Seneca Falls, N. Y. The elliptical rotary pistons are applied in this fire extinguisher for both steam engine and force pump, and are represented in figure 2—a section view. A B are two cogged rotary pistons, working into one another in an air-tight case. The pistons, *c c*, fit close to the inside of the pump case, and take into the concave parts, *a a*, of one another, in the line of their conjugate diameters. The small cogs fit into corresponding recesses, and as one is revolved

Fig. 2

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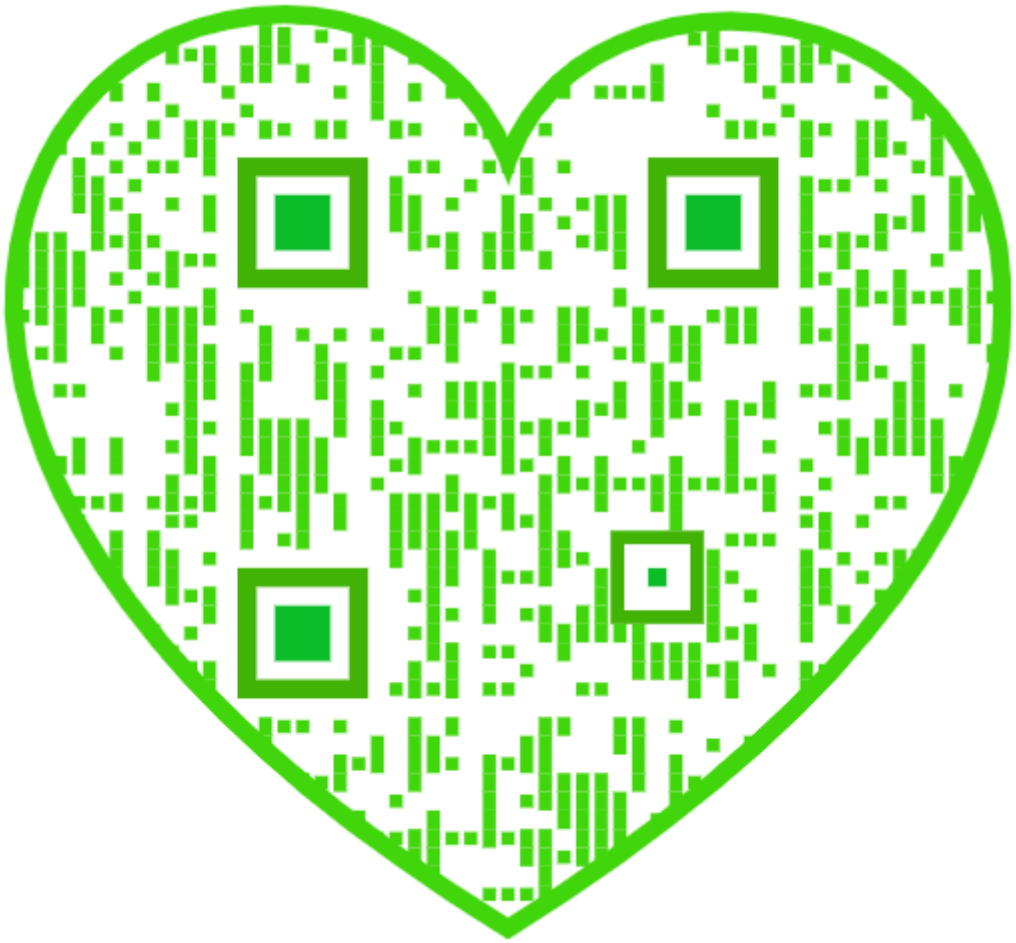


the other is carried round. The small grooves on the outer ends or peripheries of the pistons, become filled with water, and the centrifugal action makes it serve as an air-tight water packing. The rotary pistons being revolved towards one another in the air-tight case, a vacuum is formed behind them, and the water rushes in through the suction pipe, D, and is discharged through the pipe E. This constitutes the water force pump. If steam be admitted above or below the pistons and the exhaust pipe placed opposite to it, it is evident that it will answer for a steam engine as well as a pump. It is thus applied as a rotary steam and force pump in the *Neptune*, and one, two, or more such steam engines and pumps may be thus very compactly arranged on the same shafting, thus forming a most simple steam fire engine. The boiler supports the machinery, and the whole is supported on a substantial carriage. The machinery and all the parts are well constructed, and the workmanship was the admiration of every person who saw it.

At the Firemen's Tournament held at Seneca Falls, N. Y., on the 10th and 11th September last, the Judges awarded it a complimentary prize of $25 as a token of their appreciation of its merits. It threw, on that occasion, two 1 1-2 inch streams 170 feet horizontally with steam at 60 lbs. pressure. It filled a tank of 1552 gallons' capacity in three minutes and thirteen seconds. It is capable of throwing four streams and working up to 100 lbs. steam pressure. The boiler has an immense amount of tubular heating surface, the object of which is to get up steam rapidly after the fire is kindled, so as to bring it into operation on a fire in the shortest possible space of time. One great object of usefulness in a steam fire engine, is getting up steam quick; without it has this quality it will not answer.

At a trial of the *Neptune* at Seneca Falls on Sept. 4th, the *Seneca County Courier* states that it got up a working pressure of steam in eight minutes from the time the fire was kindled, and the Editor, who stood with his watch in hand timing the operation, gave it as his opinion that this time could be shortened one minute if the fuel had been better.

During the trials which took place with the *Neptune* in the Crystal Palace, and which have been noticed in our columns, it did not get up steam quite so quick. On the first trial it was not well situated to obtain a good draft; on the second trial it got up the steam much faster, and had it been placed with the furnace door towards the river (as the wind was blowing from that direction) instead of being placed in the opposite direction, it no doubt would have generated steam much faster.

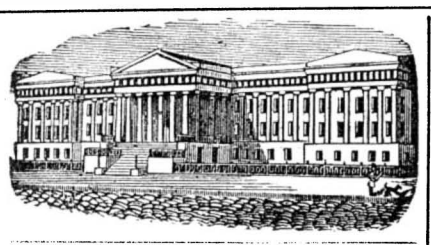
Mr. Silsby informs us, that on an examination of the *Neptune*, after its return from this city, some hard substance, like emery, was found in the bearings, which caused it to grind down and thus leak steam; it was, therefore, not in proper order during its trials here. It is now undergoing repairs, which, when completed, its owners pledge themselves for $1000 that it will surpass the engine with which it was tested at the Crystal Palace, in a steady play of from two to six hours, both using the same kind of fuel, and taking water in the same manner.

It is constructed under Birdsill Holly's patent of February, 1855. For more information address Silsby, Mynderse & Co., at Seneca Falls, N. Y.

Coal and Trees.

It is generally admitted that coal is the product of a buried vegetation—mostly trees. How thick they must have grown in the coal period! It is calculated that an acre of coal three feet thick is equal to the produce of 1,940 acres of forest. The first coal mines were worked in Belgium in the year 1198, and very soon after in England. There is now raised five times as much coal in Great Britain as in any other country; and it is estimated that there is in these isles more than 4,000 square miles of coal fields yet to be cut out.

A large number of iron paddle wheel steamers are now building at Walker-on-the Tyne, England, to run on the river Nile in Egypt.



Advice to American Patentees Concerning Foreign Patents.

It is generally much better to apply for foreign patents simultaneously with the application here. If this cannot be conveniently done, as little time as possible should be lost after the patent is issued, as the laws in some foreign countries allow patents to any one who first makes the application, and in this way many inventors are deprived of their right to take patents for their own inventions.

Many valuable inventions are yearly introduced into Europe from the United States,—by parties ever on the alert to pick up whatever they can lay their hands upon which may seem useful.

It is a part of our business to secure European patents—in fact three-fourths, and probably more, of all the patents granted in Europe to American citizens, are solicited through this office. We have faithful agents in the chief cities in Great Britain and on the Continent, and through them we can not only solicit patents, but often effect their sale upon advantageous terms. We can give the names of many of our patrons who have realized fortunes out of their European patents through our Agents abroad, if it is desired.

We are prepared at all times to furnish advice in regard to Foreign Patents, and will cheerfully do so on application personally at our office or by letter.

Models are not required in any European country, but the utmost care and experience is necessary in the preparation of the case.

Almost every invention that is of value in this country is of equal value abroad, and we would recommend patentees to pay more attention to securing their inventions in foreign countries than they have heretofore done.

All particulars in regard to the modus operandi of obtaining patents in any country where patent laws exists may be had by addressing the publishers of this paper.

MUNN & CO.,
128 Fulton street, New York.

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING NOVEMBER 4, 1856.

OPERATING THE PAWL CASES OF A SHIP'S WINDLASS—Christopher Amazeen, of Newcastle, N. H.: I am aware that it is not new to operate the pawl cases by a single brake lever, and that a lever working on a vibratory post is not new, as the same has been applied to a pump, therefore I do not claim such.

Nor do I lay claim to a single brake lever, and two levers or series of levers applied to a windlass so as to turn it by a single gear affixed on it, as is shown in the specifications and drawings of Nialance & Pelatiah Osgood's rejected applications for patents.

I claim the arrangement of the brake levers, H H, connection lever, G, vibratory posts, I I, and two pawl cases, B C, as applied to a post and windlass barrel, substantially as specified.

CUTTING METALS—Robert Anderson, of U. S. A., and Aaron H. Vancleve, of Trenton, N. J.: We claim the use of the parallel table, B, revolving table, M, and traversing table, R, in connection with machinery for punching and shearing metals, when the said tables are constructed and operated in the manner described for cutting and punching straight, curved, or irregular forms in metals, as set forth.

EQUATORIAL SEXTANT—William A. Burt, of Mount Vernon, Mich.: I claim combining with the common sextant equatorial and horizontal movements, substantially as set forth, for the purposes of obtaining latitude, time, azimuth, altitude, and declination, which are read from the instrument without computation.

I claim combining the limb, E, which moves over the face of the hour circle with the limb, n, by means of the slotted arc, or equivalent thereof, and movable bearing, K2, and vertical spindle, S.

I also claim combining the latitude circle with the limb, n, by means of the limb, E, having its center of motion on the line, m m, the arc, F, and bearing, K2, and vertical spindle, S, as set forth.

ODOMETERS—Albert Carter, of Forestville, Conn.: I claim the bearing ring, D, the catch spring, F, and the set screws, E, on which the case containing the movements turn by the action of the carriage wheel, and produces the result of indicating the distance traveled, in the manner and for the purpose as set forth and described.

R.R. STATION INDICATORS—Edwin A. Davis, of Crawfordville, Ind.: I do not claim the endless apron, F, operated by a spring, for that has been previously used for the same purpose.

But I claim the bar, Q, connected with the pawls, j j k k, and operated by the lever, R, and crank, p, arranged specifically as shown and described, for the purpose set forth.

[Instead of having the conductor of the train shout out the names of the stations on a railroad, as is now the custom, this invention is designed to show in a visible manner the name of each station, as the train arrivss at it, in the same manner that an Annunciator exposes the number of a room. The names of all the stations on the railroad are painted or marked on an endless apron confined in a box having a small show window. The rollers over which this apron passes are connected with gearing, a coiled spring and lever; the latter is so situated that it comes in contact with a projection placed at some particular spot at a station, and by this means the marked apron is moved so as to expose positively the name of the station at the window. This station annunciator may be operated by hand, but it is better to have it self-acting. Conductors often speak so indistinctly as not to be understood, and they sometimes forget to call the names of the stations; this invention obviates these evils, and is, evidently, a good improvement.]

ROCKING CHAIRS—Martin Eberhard, of Philadelphia, Pa.: I do not confine myself to the exact form of the frame or working parts.

But I claim, first, the lever, I, the link, L, and lever, K, in combination with the seat, F, and adjustable foot rest, G, the whole operating substantially in the manner and for the purpose set forth.

Second, the treddle, M, its arm, N, and link, O, in combination with the frame, P, and foot rest, G, operating substantially as described and for the purpose specified.

Third, the crank shaft, V, the lever, S, and link, T, in combination with the cross piece, C, and frame, P, substantially in the manner and for the purpose set forth.

JOINT FOR UNITING A MORTISING CHISEL TO ITS MANDREL—Joseph R. Perry, of Port Clinton, Pa.: I claim securing the revolving chisel socket, J, to the cross head or cap, H, by grooving both in the manner described, and filling the annular space thus created with a metallic composition, as specified.

R.R. CAR BRAKE—William G. Creamer, of New York City: I disclaim generally any and all plans of reserved power, for closing brakes in cases of emergency, that is not identified, and in direct combination with the apparatus that is used for ordinary cases, and if used from the engine, that is, not in combination with the usual bell or signal cord of the train.

I do not claim directly or indirectly the use of weights or springs for closing brakes, nor as a reserved power.

Nor do I claim any powerful attachment to any one car by the brake shaft, and transmitting its power from car to car by means of chains, levers, pulleys, &c., as invented by Crawford, even considering it as a reserved power.

I claim no apparatus whatever involving a connection of brakes from one car to the other.

But I claim generally the attachment of a reserved power for applying the brakes in sudden emergencies connected to and identified with the present brake shaft, as used in eight-wheel platform cars, and operating in combination with the common bell or signal cord of the train.

I claim the combination of the cross bar, D, with the spring drum, E, and circles of ratchet teeth, F and H, operating in connection with the vertical brake shaft, I, or the equivalent of a loose pulley with a double circle of ratchet teeth arranged in the same way, but actually by a weight or spring operated as described and for the purposes mentioned.

I also claim the combination of the jointed pawl, L M, and disconnecting lever, N, with the drum, E, as specified, for retaining and disengaging the reserved power when required, while the brakes are being operated by hand if necessary.

SPADING MACHINES—Ormrod C. Evans, of Staunton, Ohio: I claim the combination of a series of forks or space blades with an endless chain, and with a drum and rollers arranged in such order upon a carriage that by the progressive onward motion of the machine the said spades or forks will at first be forced by a direct or nearly direct thrust into the ground, and afterwards in the act of being lifted by the chain out of the ground shall be made to turn at such short angle with the surface as will cause the breaking and upheaving of the ground, substantially as described.

HUSKING CORN—Harlan P. Gerrish, of Boscawen, N. H.: I claim the use of the hooks, b b, or their mechanical equivalents, arranged and made to operate essentially as described, in connection with two knives, I K, for the purpose of cutting off the stalk of an ear of corn, and removing the husks therefrom.

I also claim making the cylinder, C, with the depression, c d e, for the purpose as described.

AUTOMATIC MUSICAL INSTRUMENTS—Hiram Groves, of New York City: I claim, first, constructing the barrel of automatic musical instruments of a prismatical form, and by leaving spaces between the bars or rails covering it, substantially as described.

Second, notching the rails or bars of an organ barrel, and securing in the said rails a wire, in the manner specified, and for the purpose set forth.

Third, constructing the tunes of automatic musical instruments of metallic segmental plates, in the manner and for the purpose described.

COWL OR DRAFT ACCELERATOR FOR STEAMERS—Peter C. Guion, of Cincinnati, Ohio: I do not claim any of the several devices, surfaces or parts described separately.

But I claim their combination constructively, in the manner and for the purposes described and shown.

R.R. CAR BRAKE—Dennis Harrigan, of Winchester, Mass.: I claim the compensation rods, G, in combination with the levers, J and K, or their equivalent, operating in the manner and for the purpose substantially as described.

MAKING ROPE—John Harris, of Hoosick Falls, N. Y.: I claim the described method of driving the flyers by arranging them radially to the main or laying spindle, B, and providing them with rings, G G, or wheels, or their equivalents, to roll in contact with a stationary table, F, when rotary motion is given to the main or laying spindle, said rings being adjustable to bring them nearer to or further from the center of the main or laying spindle for the purpose of varying the speed, as set forth.

[This improvement relates to rope machines having the sun and planet wheel motion. The flyers in rope machines have a motion around their own axes, and a laying motion round a central general axis. If these motions are changed relatively, so will be the character of the rope made by the machine. In this machine the flyers can be arranged with great facility to alter their relative revolutionary speeds, and thus produce any degree of twist desired. The improvement is simple and good.]

CATCH FOR INDIA RUBBER SHOES—Nathaniel Hayward, of Colchester, Conn.: I claim the use of a steel rubber, or other kind of spring catch of any proper shape, in the heel of an india rubber overshoe or clog, having a projection or lip extending out horizontally or through the quarter, as specified, whereby the overshoe is prevented from slipping at the heel, and is susceptible of being disengaged from the under boot or shoe without using the hands, as set forth.

FISHING IMPLEMENT—Elmore Horton, of Bristol, Conn.: I am aware that spring grab hooks with notched cross bar have been used.

But I claim the spear cross bar, c, notched at each end, e e, in combination with the spring jaws, a a, as set forth and described.

LOOMS—Lucius J. Knowles, of Warren, Mass.: I do not claim a single picker operating in connection with a movable series of shuttle boxes, and so as to pass from one box into another of the series as occasion may require.

But I claim a combination of a single picker staff, pickers and boxes, substantially as described, wherein there is a separate picker for each box of the series, and all such pickers are successively moved towards and operated by such single picker staff during the operation of weaving with the shuttles of the said series of boxes.

I would remark that I by no means claim making a bar with a bend or recess, as I am well aware that such, without any reference to a special use of said bend or recess is no new invention.

But I claim the improvement in the picker staff, when applied to operate a series of pickers, arranged in a set of shuttle boxes as described, the improvement consisting in the bend or recess, G, applied to the picker staff, so as to enable it while operating a picker to pass by another picker under the former, and not move the said other picker in its box, the whole being substantially as specified.

And I also claim making the picker staff with a bend or recess, g, or its equivalent, so as to enable it, while operating a picker to pass by another picker and not move the same in its box, the whole being substantially as specified.

AUTOMATIC RAKES FOR REAPERS—Pells Manny, of Waddam's Grove, Ill.; I claim pivoting the rake, B, for curvilinear play over the platform, to the up and down moving lever or supporting beam, D, and arranged to operate together and separately at intervals in relation to the platform and each other, in the manner and for the purposes set forth.

BURGLAR'S ALARM—Wm. McLachlan, (assignor to Robert Livingston,) of New York City: I am aware that alarms have been applied to locks; I therefore do not claim the alarm or any particular construction of the alarm.

I claim simply the application of a portable alarm of any construction to the key, in the manner set forth, so that the key being in the lock in one position cannot be interfered with, or the position changed without indicating the same by causing an alarm to be given.

LUBRICATOR—James F. Monroe, of Fitchburg, Mass.: I claim the plate, H, and plug, E, as arranged and combined with each other and with the lubricating cup for the purpose set forth.

SPRING FRAME FOR PACKAGES—Henry B. Osgood, of Dorchester, Mass.: I claim the arrangement of the protector frame, B, in relation to the box or other receptacle, A, and its combination therewith by means of the elastic fastenings, C, or their equivalent, substantially as and for the purposes set forth.

HAY RAKES—Thomas R. Roach, of West Needham, Mass.: I claim the springs above and below the teeth, operating in the manner and for the purpose substantially as set forth.

TROWELS—L D. Phillips, of Chicago, Ill.: I do not claim a mortar chamber having a follower operated in it, as that has been heretofore known.

But I claim, first, the open bottomed chamber provided with flanges or trowels, D D, arranged in the manner and for the purpose described.

Second, I claim the adjustable gauges, E E, as applied to my trowel, operating in the manner and for the purpose described.

Third, I claim the general arrangement of the follower and its appendages, viz., springs, B B, guide or brace, C, and handle, I, in the manner and for the purposes described.

COTTON GINS—Wilson A. Purdom, of Jackson, Miss.: I claim, first, giving to the cotton to be ginned within the feed box and before the saws, H, a reciprocating motion, by means of the corrugated cylinder, A, or a modification of such cylinder, and the corrugated aprons, B, or either of them separately, or their equivalents, so that the cotton will pass back and forth slowly in bulk, or nearly so, before the saws, thus presenting a fresh surface to the action of the saws throughout the entire length of the saw cylinder without leaving any of the saws idle, and without the accumulation of seed at one end of the box, or the banking up of the cotton at either end.

Second, for the purposes aforesaid I claim the cylinder, A, or its equivalent, whether it is placed within or outside of the cotton roll, and whether it is permanently attached to the apron, B, or not, also whether it revolves or not, or whether that revolution is continuous or intermittent.

Third, and for the purposes described I claim the corrugated apron, B, or its equivalent, whether it is operated conjointly with the said cylinder, A, or not.

HUSKING CORN—Joshua Perkins, of West Killingsley, Conn.: I claim the improvement of so operating the two two cutters or chisels, A and B, that during their descent into the stalk of the cob they may pass into it in contact with each other, so as to pierce but one hole, and thereafter receive a lateral motion simultaneously in opposite directions, so that while one chisel or cutter is made to discharge the husk from the machine, the other is caused to discharge the ear therefrom in the manner described.

CHAIN PUMPS—John Robingson, of New Brighton, Pa.: I do not claim the drum or wheel, B, with the buckets hung as described in it, and tilted by striking a stop, the bucket chains passing round the sides of the drum, as such and many other parts or details are common to chain bucket pumps.

But I claim providing the wheel, B, having its buckets and chains arranged as described, with a partition, C, forming troughs, D D, and tilting stops or bars, G, arranged relatively to each other, and rotating together with the wheel and its buckets for operation together, as specified.

[This patent for an improvement in chain pumps relates to the method of discharging the water from the endless chain of buckets to a discharging wheel, which contains chambers for receiving the water. This wheel rotates and discharges the water from its troughs into the pail or tub placed to receive it. It is stated to be a very convenient arrangement for discharging the water.]

SEWING MACHINES—S. H. Roper, of Roxbury, Mass.: I claim, first, a thread guide which guides the thread into the eye of the needle by means of the projection, y, and the thread holder, m, forming a thread clamp, and griping and holding the thread between them, while the thread guide with its clamp revolves until the thread is wrapped partly round it, and stretched across the aperture therein; and then also by means of the thread guide with the thread thus held moving laterally, until in this manner and by means of these rotary and lateral motions the thread is effectually guided into the eye of the needle.

Second, the working of eyelet holes in cloth or other material by means of a rotary feed motion combined with the slotted tube, v, and two needles, all substantially as described.

STARTING AND STOPPING WATER WHEELS—David M. Tyler, of Lisle, N. Y.: I claim the combination of the frame upon the main shaft, and the spring dog, i, on the same, with the notched disk, D, and the rods leading to the swinging buckets, or their equivalents, for effecting the opening of the issues and locking of the same, substantially as set forth.

I also claim the beveled disk, B, in combination with the studs of the dog, or their equivalents, arranged and operating substantially as set forth, for permitting the water in the wheel to close the issues.

THROSTLE SPINNING MACHINES—Joel Smith, of Northbridge, Mass.: I claim regulating the twist of the yarn in ring spinning machines by communicating a gradually accelerated motion, proportionate to the gradually increasing diameter of the bobbins, to the rolls, which give out the yarn to the bobbing, substantially in the manner and for the purposes set forth.

WEAVING LONG WARPS—John C. Smith, of New Hartford, Conn.: I do not claim a carriage traveling at right angles with a warping frame, carrying the beam so that the warp may be laid in a regular succession of layers as received thereon, for I am aware that such is not new.

Nor do I claim dispensing with a warp beam in manufacturing cloth, for I am aware that cloth has been woven with yarns for the warp taken directly from spools.

But I claim a box arranged substantially in the manner and operated by the mechanism described, in combination with the arrangement for dispensing with the warp beam as described, for the purpose of laying the warp in a regular smooth succession of layers evenly, that the box may give out the warp free from twists or tangles.

STIRRUPS FOR RIDING SADDLES—Richard Trussell, of Brooklyn, N. Y.: I do not claim the toe pieces, as I am aware that a toe piece has been used on a foot piece attached rigidly to the bow of the stirrup.

But in combination with the use of the toe piece or its equivalent I claim the attachment of the foot piece, B, to the bow, A, of the stirrup by a shaft, C, or other connection of similar character, furnished with a spring, e, to operate in the manner substantially as set forth.

[This stirrup has a bow made separate from the foot piece, and the latter is hung loosely on a spindle or shaft passing through the bow at each side. There is a turned up toe curb on the foot piece, to prevent the foot of the rider passing too far through. There is also a spring under the spindle of the foot piece. If the horse should start to the one side, or rear backwards, or throw the rider forwards, the toe part of the foot piece of the stirrup will swing up at an angle, and the foot of the rider be thrown out of the stirrup. Many persons have lost their lives by being thrown from horseback, and one foot retained in the common stirrup, whereby they were dragged along, dashing on the ground until life was extinct. This improvement will prevent such accidents. It is simple and good, and applicable to ladies' as well as gentlemen's saddles.]

SAWING MARBLE AND STONE—George J. Wardwell, of Hatley, Canada: I claim suspending the swinging saw frame, B, from levers, C C, when arranged as described, and constructed with or without the circular bearing surface, O, resting on the friction roller or rollers, G, in the end of the vertical lever or levers, D, attached to and swinging with the swinging saw frame, B, the whole being arranged in the manner and for the purpose specified.

SEWING MACHINES—Isaac M. Singer, of New York City: I do not wish to be understood as limiting my claim of invention to the precise form and construction of parts, as these may be varied without changing the principle of my invention.

I claim operating the needle to give it the required reciprocating motions, substantially such as described, by a crank pin or roller on a rotating shaft, acting in a cam groove, substantially such as described, whereby the required motions are imparted to the needle with much less extent of motion of the crank pin or roller in the cam groove, and consequently less friction than if the cam groove were on the shaft, and the pin or roller on the needle carrier, as described.

I also claim projecting the operative part of the surface of the feeding apparatus through the surface of the table, substantially as described, so that such feeding surface may act on a portion of the under surface of the material to give the required feeding motion to space the stitches, while the other portions of the said material slide on the

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table which answers the purpose of stripping the said material from the feeding surface, and to cover and protect the mechanism which operates the feeder, as set

I also claim imparting the feeding motion to the feeder, to present the material to be sewed to the action of the needle for spacing the stitches, by griping the periphery thereof, or any equivalent therefor, by a griping lever, substantially as described, in contradistinction to the action of a pawl or hand, catching on to ratchet teeth, whereby the extent of feeding motion may be adjusted and varied to any degree instead of being restricted by the size of ratchet teeth, and whereby also I avoid the wear and liability to derangement incident to the use of a ratchet motion, as set forth.

And lastly, I claim in combination with the feeder attaching the presser for controlling the material to be sewed, and holding it to the surface of the feeder to a slide or equivalent therefor, substantially as described, so that the plane of its under surface shall always bear the same relations to the plane of the table in a line at or nearly at right angles to the line of the seam, whether the material to be sewed be thick or thin, and for the purpose set forth.

HEATING OR COOKING BY GAS—Wm. F. Shaw, of Boston, Mass.: I claim combining with the wire gauze or perforated tube, D, and the air and gas burner, A, an air guide or concentrator, G, applied thereto, substantially in the manner and for the purpose specified.

SELF-ACTING HEAD AND TAIL BLOCKS FOR SAWING MILL—A. S. Walbridge, of Burlington, Vt. Patented in Canada, July 20th, 1853: I claim the combination and arrangement of the T-shaped carriage blocks, B B, connecting rack, C, and setting off shaft, E, substantially as specified, whereby a self-operating carriage of any desired length or compactness is produced.

I also claim the self-setting-off device, composed essentially of the ratchet, I, disks, V W, adjusting stop, O, and stationary cam, U, arranged and operating substantially as described.

DRAIN TILE MACHINE—Thomas Maycock, (assignor to himself and Henry Rice,) of Buffalo, N. Y.: I claim the combination of the annular ring, I, with the plunger, the latter having a smaller diameter than the ring and cylinder, constructed arranged and operating substantially in the manner and for the purpose set forth.

FABRIC FOR UNDERLAYING CARPETS—William S. Pratt, (assignor to J. S. C. Thursby,) of Brooklyn, N. Y.: I claim the described cellular paper or paper board, for the purpose of underlaying carpets on floors.

[The fabric which forms the subject of this patent consists of thick paper or paper board, made cellular by perforating it thickly. When it is laid between a carpet and a floor, the dust, which is always driven in greater or less quantities through the carpet by sweeping, is forced and retained in the holes or cells, leaving the carpet much cleaner than if placed on the bare floor, or with straw under it, in the common way. It also obviates the necessity of taking up the carpet so frequently to beat and shake it, as it keeps quite clean until all the cells are filled with fine dust. This fabric lying under carpets, by securing the dust underneath not only makes the colors appear more fresh, but also serves to make the carpet wear longer. This invention is a simple one, but very useful and good, and will, no doubt, come into general use. It has been assigned to J. S. C. Thursby, rope manufacturer, of Brooklyn, Eastern District.]

POWER LOOMS—Alexander Smith & Halcyon Skinner, of West Farms, N. Y.: We claim, first, mounting the yarns for forming the ranges of tufts in parcels on a series of spools, or equivalents therefor, in the order required for producing the design or pattern required, so that each spool, or the equivalent therefor, may be brought in succession to the required position for each range, substantially as described.

Second, the mode of operation substantially as described, by which the spool frame required at each operation is brought down in close proximity with the tufting warps and then carried out of the way of the lay when performing its operations, as described.

Third the mode of operation by which the tufts of yarn are introduced and applied to the tufting warps, substantially as described.

Fourth, the mode of operation by which the tufts are cut off from the yarns after they have been introduced and applied to the warps, substantially as described.

Fifth, the mode of operation by which the tufts are carried to the required place in the fabric by the combined action of the reed and plate, or any equivalent therefor, as described.

Sixth, and in combination with the several modes of operation by which the tufts are introduced, the employment of the heddle motion, substantially as described, for binding and holding the said tufts by the warp threads.

SHUTTER FASTENER—David M. Lawrence, of Cincinnati, Ohio: I claim a lock plate, D, when constructed with a semi-circular flange, having a series of notches cut therein, in combination with the spring stop, E, and hinge, C, the whole being arranged substantially as and for the purposes described.

CRUSHING ROLLERS FOR ORES—Wm. H. Plumb, of New York City: I claim the construction, combination, and arrangement of the stationary and movable roller adjusted to the work to be done, in the manner and for the purposes set forth.

CIDER MILLS—Benj. Mackerley, of New Petersburg, Ohio: I am aware that round teeth whose sides are spirally and annularly grooved have been used on a cylinder, and within the concave combined therewith.

I claim the combined use of flat-sided saw-edged teeth upon the cylinder and within the concave, substantially as set forth.

TOOL FOR TENONING, &c.—Alfred Tippett, of Washington, D. C.: I claim so making of the chisels adjustable in the stock as that they may be made to cut also a dovetail tenon with the same tool, and without reversing the same, and so that said tool may be used in any ordinary mortising machine, and thus avoid the expense of two machines, the whole being arranged specially as set forth and for the purposes described.

RE-ISSUES.

CUTTING SHOE PEGS—Stephen K. Baldwin, of Gilford, N. H. Patented July 16th, 1856. Extended 7 years from July 16th, 1842: I claim the combination of the vibrating knife, C, or its equivalent, with the fluted roller, O, or its equivalent, operating in the manner described.

SEWING MACHINES—Elmer Townsend, (assignee of Alfred Swingle,) of Boston, Mass. Patented July 22d, 1856. I claim the employment of a hook in connection with the looping needle, and arranging said hook so that it shall pass into the cloth or material from the same side of it on which the looping needle works or is situated.

I further claim the method of arranging the feed motion or mechanism, the feed wheel thereof being disposed horizontally, and its teeth made to engage with those of the rack situated on the vertical side of the clamp, the whole being substantially as specified.

DESIGN.

STOVES—James J. Dudley, (assignor to Fuller, Warren & Morrison,) of Troy, N. Y.

A Patent Case.—Confusion Confounded.

Sickles' Cut-off.—On the 6th inst., before Judge Nelson, U. S. Circuit Court, this city, a very important case was decided respecting the infringement of the patent of Sickles' cut-off for steam valves.

The parties were Sickles against Wm. Borden, proprietor of the splendid steamboat *Metropolis*, running on the line between this city and Fall River. The complaint was that the cut-off used on the *Metropolis*, known as "Allen & Bell's adjustable cut-off," was an infringement of Frederick Sickles' patent, granted May, 1842. The case was before the court for about two weeks, and was defended by Messrs. Stillman, Allen & Co., of the Novelty Works, this city, Mr. Horatio Allen, the inventor of the cut-off against which complaint was made being the principal witness. The defence rested mainly upon the ground that there was no infringement of the Sickles patent; that the cut-off on the *Metropolis* was essentially different from that of Sickles. The Court charged the jury in favor of the plaintiff, and after a very few minutes the jury returned a verdict against the defendants, assessing the damages at $750, for sixty days use of the invention, for which period this action only covered. It has now been in use on this steamboat for more than two years, so that a new action would cover its use up to the 20th of May last, the date on which the patent expired. At the rate of $750 for sixty days use, the amount for two years would be over $12,000—a rather snug sum.

This case we hold to be a very remarkable one. Here we find a company sued for damages for infringing a patent which the Patent Office has declared was issued illegally, and for which an extension was refused, as set forth on page 309, of our last volume, on the grounds that it was not the invention of F. Sickles.

Mr. H. Allen, who is an experienced engineer and inventor, evidently considered his cut-off essentially different from that of Sickles'. The decision of the Jury was based upon quite a different opinion. Who is right?

Table of Patents Issued to Each State, in the year 1855.

CLASSES.	I. Agriculture.	II. Metallurgy and Manufacture of Metals.	III. Manufacture of Fibrous and Textil Substances.	IV. Chemical Processes, &c.	V. Calorifiers, Lamps, Stoves, &c.	VI. Steam and Gas Engines.	VII. Navigation and Maritime Implements.	VIII. Mathematical, Philosophical and Optical Instrum.	IX. Civil Engineering and Architecture.	X. Land Conveyance.	XI. Hydraulics and Pneumatics.	XII. Lever, Screw, and other Mechanical Powers.	XIII. Mills and Mill Gearing.	XIV. Lumber and Machines.	XV. Stone and Clay Manufactures.	XVI. Leather, &c.	XVII. Household Furniture, &c.	XVIII. Arts—Polite, Fine, &c.	XIX. Fire Arms and the like.	XX. Surgical and Medical Instruments.	XXI. Wearing Apparel, &c.	XXII. Miscellaneous.	Totals.
Me.	1	2	4	1	2	1	2	0	0	1	0	0	1	2	0	0	1	2	1	0	0	0	21
N. H.	7	2	7	1	2	0	0	2	2	2	3	1	1	6	1	2	0	1	0	1	0	1	42
Vt.	3	1	0	0	2	0	1	0	2	6	3	1	0	7	2	0	2	1	0	1	1	1	34
Mass.	15	21	34	11	28	11	13	2	14	9	14	5	3	30	6	16	19	27	9	3	0	10	300
R. I.	2	0	7	1	3	2	1	0	0	0	0	0	0	0	0	0	0	1	2	0	1	1	21
Conn.	5	21	9	1	6	5	0	1	0	1	8	4	0	9	2	1	6	5	13	0	1	6	104
N. Y.	46	42	38	22	33	25	29	7	29	41	29	13	10	53	12	12	23	32	11	8	4	15	535
N. J.	4	5	8	9	4	7	2	3	1	1	5	0	2	9	2	4	0	5	5	1	0	3	80
Penn.	17	13	17	13	26	14	3	2	18	3	11	4	12	18	6	6	7	18	4	2	2	12	228
Del.	1	0	0	0	0	0	0	0	0	3	3	0	0	0	0	0	0	0	0	1	0	0	8
Md.	4	0	3	0	2	0	3	0	1	4	2	0	3	2	3	1	2	0	0	0	0	0	30
Va.	16	1	0	1	3	0	0	1	2	4	1	3	3	4	0	0	3	1	0	0	1	2	46
N. C.	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	4
S. C.	0	1	2	0	0	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	7
Fla.	0	0	2	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4
Ga.	0	0	3	0	0	1	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	7
Ala.	2	1	0	1	1	0	0	0	1	0	1	1	0	1	0	0	1	0	0	0	0	1	11
Miss.	1	0	2	0	0	0	1	0	2	0	0	1	1	1	0	0	0	0	0	0	0	0	9
La.	1	1	2	2	3	2	0	0	0	1	0	1	2	1	0	0	0	0	0	1	0	0	17
Ark.	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Texas	3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4
Mo.	2	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	7
Tenn.	0	0	0	1	0	1	1	0	2	0	0	0	0	1	0	1	0	0	1	0	0	0	8
Ken.	3	2	1	2	0	2	0	0	2	3	1	1	0	1	2	1	1	0	1	0	0	1	23
Ohio	23	7	3	3	5	7	2	0	10	7	5	4	5	9	2	2	9	9	4	2	0	2	120
Ind.	9	1	0	1	0	0	0	1	2	5	1	1	4	5	1	2	4	0	1	0	0	0	38
Ill	23	1	0	0	3	1	0	0	2	0	4	1	1	2	0	0	2	0	2	1	1	2	46
Mich.	11	0	0	0	1	1	1	0	0	2	0	1	0	5	1	1	1	3	0	0	0	0	28
Wis.	2	0	2	0	1	1	0	0	1	1	3	0	0	2	1	0	1	0	0	0	0	0	15
Iowa	2	0	0	0	1	1	0	0	1	1	1	0	0	2	0	0	0	0	0	0	0	0	9
Minnes.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cal.	1	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	5
D. C.	0	0	2	1	4	3	1	0	1	1	0	0	2	2	4	2	1	2	2	0	0	1	29
Foreign	5	2	4	5	2	1	4	0	0	1	0	0	0	1	2	7	1	1	2	0	1	1	40
Total	210	125	151	78	134	86	66	20	95	98	98	43	51	177	43	58	84	108	59	21	12	59	1881
Extensions,																							20
Re-issues,																							51
Designs,																							71
Disclaimers,																							4
Grand Total,																							2027
Patent 13,892, entered twice in Class II.																							1
Correct number,																							2026
Number as by Commissioner's Report,																							2024
Difference,																							2

REMARKS—New York and Pennsylvania are the only States that have patents in every class.

The greatest number of patents in any one class was for class 1; the next for class 14.

Harvesters, seed planters, looms, sewing machines, pumps, saws, and fire-arms seem to have employed many inventors the number of patents for those articles being:—Harvesters, 58; seed planters, 39; looms, 33; sewing machines, 39; pumps, 35; saws, 40; and fire-arms, 34. Total, 278. If we reflect on the long time that looms, pumps, saws, and fire-arms have been in use, it seems surprising that so much novelty was so lately discovered in them, and the present year will doubtless bring to light nearly as much more. It may be interesting to the lovers of good segars, to know that a patent was granted for substituting maize (or indian corn) leaf for tobacco, probably a new improvement, but is it useful? Lovers of "the weed" must answer.

T. G. S.

Ridge, Md., October, 1856.

High Railway Velocities.

The London *Mining Journal* states that M. Jobard, of Brussels, is of opinion that no insurmountable difficulties would be encountered in raising the ordinary speed of railway trains to 500 miles per hour. He advises an extremely firm built carriage, three tubular boilers in front, supplying three rotary engines, placed upon the axes of three large driving wheels of 20 feet diameter, Roucheries' preserved sleepers, a central safety rail for sharp curves, and steel-surfaced rails and wheels.

Mr. Jobard is a very clever man and a tolerable writer upon patent law, but he has got his head out of joint on railway traveling.

The Richmond, Va., *Whig* has seen several beautiful white silk handkerchief, made by the Misses Willis, of Rappahannock county from the product of silk worms fed by themselves.

Patents Extended During 1855.

The following is the list of the patents which were extended during 1855. These are never made public until the Commissioner's Report is published, and this is the reason why they do not appear in our regular weekly lists. The extension is for seven years from the close of the first term, or twenty-one years from 1841, consequently they will all expire in 1862, except the two which are dated 1842.

Working the steam valves of steam engines when the steam is cut off and allowed to act expansively.—Robert L. Stevens & Francis B. Stevens. January 25th, 1841.

Applying Water to Fire-Engines.—Franklin Ransom & Uzziah Wenman. February 13th, 1841.

Seed Planters.—Moses Pennock & Samuel Pennock. March 12th, 1841

Cutting Square Joint Dovetails.—William Perrin. March 24th, 1841.

Construction of Iron Truss Bridges.—Squire Whipple. April 24th, 1841.

Form of the Screw Propeller.—Ebenezer Beard. April 10th, 1841.

Pumps.—Jesse Reed. April 16th, 1841.

Constructing Screw Wrenches.—Loring Coes. April 16th, 1841.

Constructing Railroad Carriages to ease the Lateral Motion of the bodies.—Charles Davenport & Albert Bridges. May 4th, 1841.

Dredging Machinery.—J. R. Putnam. May 6th, 1841.

Machine for Riving and Dressing Shingles.—Wm. S. George. May 29th, 1841.

Marine Steam Engine.—Charles W. Copeland. June 11th, 1841.

Endless Chain Horse Power.—Alonzo Wheeler & Alexander F. Wheeler, Executors of this last will and testament of Wm. C. Wheeler, deceased. July 18th, 1841.

Portable Circular Saw Mill.—Wm. W. Calvert & Alanson Crane. July 16th, 1841.

Constructing Gins for Ginning Cotton.—Joseph T. Pitney. July 23d, 1841.

Machine for Removing Buildings, &c.—Lewis Pullman. August 21st, 1841.

Machine for Sticking Pins into Papers.—Samuel Slocum. September 20th, 1841.

Making Pipes or Tubes of Lead, Tin, &c.—George N. Tatham & Benjamin Tatham, Jr. March 29th, 1841.

Wire Heddles for Weavers' Looms.—Abraham Howe & Sidney S. Grannis. October 11th, 1841.

Saw Mill for Re-sawing Boards, &c.—Pearson Crosby. November 3d. 1841.

Spark Arresters.—Wm. C. Grimes. February 12th, 1842.

Thrashing and Winnowing Grain.—Andrew Ralston. Feb. 21st, 1842.

Now that the Presidential Election is over, we hope our inventors and mechanics will turn their attention more earnestly to the practical wants of the country. We must go on from one step of progress to another in the practical arts. There is no stand-still policy The demands of the age are not met.

Inventors, send on your sketches and models for examination.

We would call the attention of whoever wants an excellent steam engine to the advertisement of S. C. Hill's. We saw the engine running at the late Fair of the American Institute, and were much pleased with it.

A bed of coal has been discovered by the officers of the U. S. steamer *Massachusetts*, in the Straits of St. Juan de Fuca.

Trial of Portable Corn Mills.

At the late Indiana State Fair seven corn mills were tested together. Each mill was made to use eleven feet lever, and to perform twenty revolutions, while their hoppers were kept supplied with ear corn of the same quality. The following shows the average power employed and the quantity of meal made by each mill:—

	Lbs. power.	Qts. meal.
Excelsior Young America	382	58
Star Mill	370	53
Brant's Mill	234	44
Little Giant	387	78

Eagle and Troy Mill broke down.

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New Inventions.

Making Malleable Iron Direct from the Ore.

Our engraving illustrates an invention which promises to be of much importance, by M. S. Salter, of Newark, N. J. It relates to the making of malleable iron direct from the ore and consists in expelling the impurities of the ore by exposing it to a moderate heat during the first stages of the process, and in then gradually increasing the temperature; agitation is kept up throughout the operation. The whole process is effected by one fire, and by a single furnace of peculiar construction, a side elevation of which is shown in our engraving.

The furnace contains three chambers, A B C, arranged one above the other, the heat of the lower chamber passing into that next above, and so on.

The fire-place or grate for fuel, D, is at one end of the lower chamber, from which it is partly separated by a double wall, E, raised to a convenient hight, and over which walls a space is allowed for the passage of the draft.

The draft passes horizontally, in a reverberatory manner, along the entire length of the lower chamber, A, in the roof of which, at F, there is an opening into the middle chamber, B; it passes in the same manner through B, and thence through the opening, G, finally escaping by chimney H.

The ores, with the necessary materials for their reduction, are introduced into the upper chamber, C, through an opening in the roof; they are first suspended in the hopper-shaped receptacle, J, which is provided with a slide valve or shutter, K. The ores are then, at suitable intervals of time, removed to the draft opening, G, through which they are thrown down to the middle chamber, B; they are next thrown down openings. F, into the lower chamber, A; next they are removed to the lower chamber to the finishing basin, L, near the fire, D, where the effects of the heat are completed, and whence they are taken out, in the metallic state, ready for the hammer.

Through the sides of all the chambers openings, M, are made, through which the ores and materials may be frequently agitated by suitable instruments, and moved along from one end of the several chambers to the other, and finally through N, the metal may be molded and taken out from the furnace. The ashes are removed at O.

There are also openings for the blast, for the fuel, and for the letting off of any liquid matters which may accumulate in the finishing furnace. Through the floor of the lower chamber there is an opening, P, in the end opposite the fire, through which may fall the cinders and ashes, and other solid materials carried along thither by the draft. For the same purpose other suitable receptacles are provided in the other chambers.

To prevent any undue accumulation of heat in the middle and upper chambers, or to prevent the introduction to said chambers of cold air, or air charged with oxygen coming through openings in the lower chamber, flues, Q, are made to lead from the lower chamber upwards, directly through the top of the furnace. These flues are ordinarily kept closed by dampers, R, and when they are opened the draft is prevented from pursuing its ordinary passage by a damper, S, on the top of the chimney.

To prevent the too violent effects of the heat, openings, T, are made in sides and ends of the furnace, for the introduction of cold air between the roofs and floors of the chambers. The floors of the several chambers may be either horizontal or inclined.

The lower chamber, A, is raised up from the ground for the convenience of working, for the easy flowing away of liquid impurities, and for the falling down of ashes and cinders. This process is alleged to afford the following advantages :—

1. The gradual heating of the ores with the necessary materials for their reduction as they are moved nearer to the fire from chamber to chamber, and from one end of a chamber to the other.

2. Opportunity is afforded for the frequent agitation of the ores and materials, by which agitation the impurities are freely allowed to escape, the materials are properly mixed, and become, in turn, equally exposed to the heat and to the draft.

3. The draft is unconfined, and moves freely and rapidly for carrying off the impurities.

4. The atmospheric air is deprived for the most part of its oxygen by the fuel of the fire-place, and, therefore, while passing rapidly through the ores, it does not oxydize the metal, and does not consume the carbon, which is consequently allowed freely to extract the oxygen from the ores. By the gradual heating and freedom of draft and frequent agitation, an opportunity is afforded for the free escape of impurities in their natural order, beginning with the more volatile, and ending with the more fixed. Such escape of gaseous products is more difficult while a mass of solid materials from which they are generated remains at rest.

5. The agitation may be carried on at different temperatures, so that the objects which it cannot effect at one degree of heat it will at another. This is the purpose of the three several chambers, of which the upper is the heating and vaporizing, the middle the mixing, and the lower the reducing and finishing chamber.

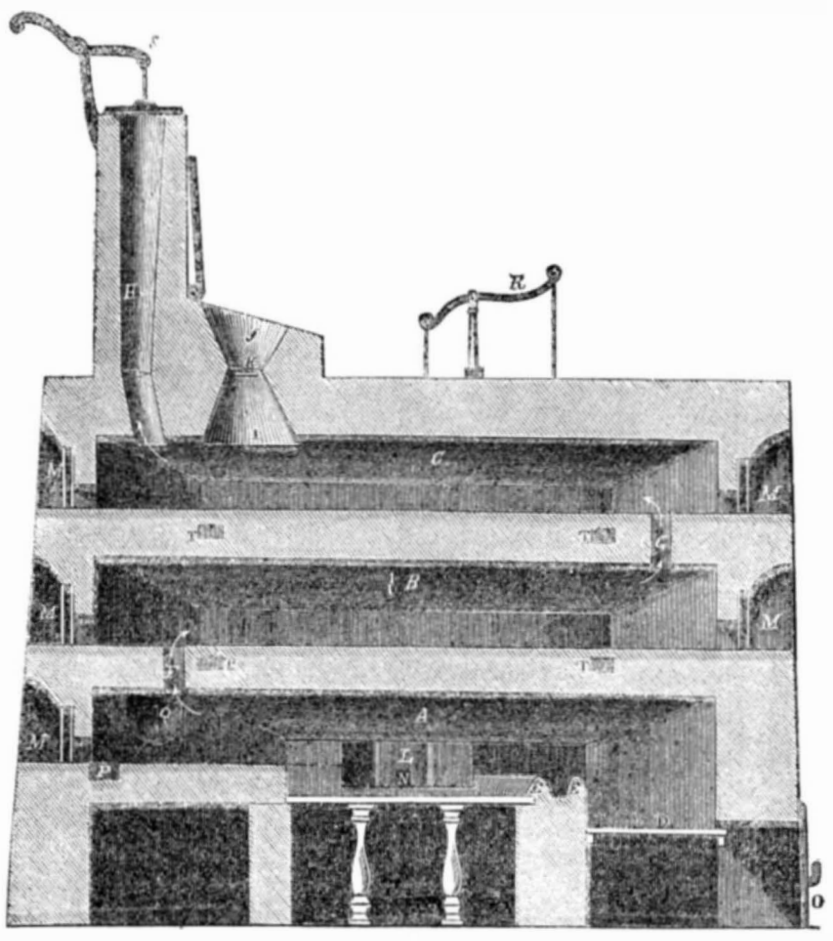
It is alleged that the ores can be reduced to metals of more than ordinary purity by the above-mentioned means. The ores of iron may be reduced to wrought or malleable iron without first carbonizing the iron. They may be reduced also to a carbonized state, either as steel or as cast or pig iron; this may be done by having less agitation and adding an excess of carbon.

The necessary materials for the reduction of the ores may be introduced at different temperatures, and at different stages of reduction, according as their presence may be needed. For example, when lime is required for separating silica from iron ore, such lime need not be introduced at the beginning of the process, when the temperature is low, for at such temperature it cannot act upon the silica, and its presence would certainly interfere with the free expulsion of other impurities. It may, therefore, be introduced partly in the middle and partly in the lower chamber, as needed.

The carbonic acid gas evolved from the limestone or shells introduced in the lower chamber tends to protect the carbon and ores and impurities from the residuum of free oxygen left in the draft.

It is claimed that this process yields a greater percentage of metal from any given amount of ore than is obtained by other furnaces heretofore used. The ores and the necessary materials for their reduction are, through the whole process, completely under control, subject to such various treatment as they may require at different stages of reduction, and opportunities are afforded for the escape of impurities without their combining with and carrying off the metals.

NEW PROCESS FOR MAKING MALLEABLE IRON DIRECT FROM THE ORE.



Another advantage claimed is that ores may be reduced by the use of anthracite coal alone, both as fuel and as the deoxydizing agent, the impurities of that coal (such as sulphur) are expelled at a low temperature before such coal acts on the ore, and, consequently, before the metals still in the ore can be effected by such impurities.

It is also alleged that there is a saving of coal as fuel, both as fuel and a deoxydizing agent; this is effected as a deoxydizing agent, because no more coal is used than is necessary to extract the oxygen from the ores, none entering into the iron, and also from the rapidity of the operation, very little being carried off by the draft. The saving of coal as fuel is effected partly by the various facilities already enumerated, for the expulsion of impurities, partly by the prevention of the escape of heat, one chamber being compacted upon another, and partly by the long continuous range of the draft, to the whole force of which the ores are exposed by their position, agitation and falling. Owing to the freedom of draft there is no mechanical pressure by said draft upon the ores, therefore it cannot, by the force of such pressure, prevent the chemical decomposition of the ores, nor carry away the pulverized particles of ores and carbon.

We are informed that this process has been thoroughly tested and found to succeed far beyond expectation.

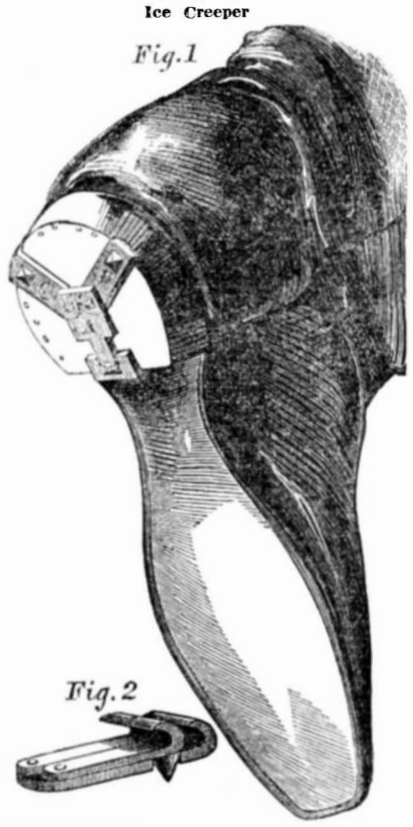
It is alleged to be so cheap and expeditious as to render the expense of producing malleable iron of the best quality less than that of pig iron made in the common blast furnaces. If this is so, it certainly is a remarkable invention, and will give a wonderful impetus to the manufacturing and industrial industry of this country. Patented Nov. 20th, 1849. For further information address the patentee as above.

THE MANUFACTURE OF IRON.—From time immemorial the manufacture of iron has been conducted with but little change in the methods; these may be divided into two heads. First, the production from the ore of pig or cast iron by smelting in blast furnaces. Second, the conversion of pig iron into a malleable state in small low furnaces, termed refineries, or by puddling in furnaces.

In the first process the ore (an oxyd of iron) is deoxydized by being burned with some carbonaceous substance, such as charcoal, coke, or anthracite. After burning a certain period, the ore is wholly deprived of its oxygen, and has become soft or wrought iron; it is at this point that it is desirable to arrest the process, but in the common furnace the materials are shut up from view for about twelve hours, and there are no means for ascertaining when the deoxydation has been completed exactly. As a consequence, the metal is kept at a high heat in contact with the carbon, after the oxygen has been driven off, and the result is a union of an excess of carbon with the metal, which is converted into a carburet—pig iron. This product is indeed more useful, compact, and portable than the ore, but it requires to undergo another expensive process before it is converted into wrought iron. Mr. Salter's invention for making wrought iron direct from the ore in open chambers, is designed to enable the smelter to arrest the reducing process at the point where the deoxydization of the ore has been completed, and before an injurious excess of carbon has been absorbed by the metal. By this method but one process is required, and wrought iron is thus produced, it is stated, at the same cost as pig iron; the latter is worth only $35 per tun; the wrought iron from $85 to $90.

Should the anticipations of the inventor be realized, his invention will work a revolution in the iron interest throughout the world; but will it operate practically? Is the question to be determined.

Ice Creeper



Our engraving illustrates a small contrivance to be attached to the heels of one's boots, to prevent slipping upon the ice. It consists of a central strip of metal, A, to which two other pieces, B C, are pivoted. as shown. The surface of each is furnished with a point or spur, which enters the ice. The extremity of each strip is curved into hook form, and these hooks serve as clamps to hold the contrivance to the heel, when it is spread and applied as in fig. 1. When not in use it may be folded, as in fig. 2, into compact form, and carried in the pocket. This is a neat, cheap, and convenient invention. Patented by Wm. H. Towers, March 5th, 1856. Address Thos. W. Williams, 39 South Fourth street, Philadelphia, Pa., for further information.

Ward's Bullet Machine.

The machine of Wm. Ward, of Auburn, N. Y. (which was noticed by us a few weeks since) for making lead bullets from wire, with extraordinary rapidity and accuracy, is now at the Navy Yard, Washington, for inspection by the officers of the government.

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Scientific American.

NEW YORK, NOVEMBER, 15, 1856.

A Substitute for Leather Wanted.

When rags for the manufacture of white paper were so dear two years ago, the influence of the Press produced quite an excitement in regard to the importance of discovering some cheaper substitute; and had they not become cheaper, no doubt their place would have been supplied, in a great measure, by straw or wood pulp paper. There is another material equally as valuable, and as necessary, which has recently advanced so much in price, that we think it well to direct the attention of inventors to it, to see if they can search out some new invention as a substitute—we allude to *leather*. The value of the 350,000,000 lbs. of paper (at 10 cents per pound) now manufactured annually in the United States, amounts to $35,000,000 per annum, while, at the time the last census was taken the value of the hides and skins manufactured into leather amounted to no less than $40,000,000. Since that census was taken, leather has increased in price about fifty per cent., and has thereby, in proportion, increased the expenses of the people. Leather is a material so universally used, that every man, woman, and child in the country has an interest in it.

In answer to inquiries respecting the reason for this rise in the price of leather, we have been told that increased scarcity of the raw tanning materials and raw materials to be tanned, is the cause. When we find that with the many improvements made in the machinery and processes for tanning during the past few years; and also the application of india rubber and gutta percha to many purposes for which leather was once used, that its price has been steadily advancing, and this on account of the scarcity of cheap raw materials, surely it is time that the attention of inventors was directed to the discovery of some substitute

The material that would answer as a substitute for leather must have peculiar qualities, for on this globe "there is nothing like leather." It is strong and flexible; almost a water repellant, and yet it allows of the escape of insensible perspiration through its pores. For boots and shoes nothing can equal it, and as a material, the finer kinds are really beautiful.

The many purposes for which it is used renders it of great consequence to obtain it cheaply, but knowing the peculiar qualities which it possesses, it would almost appear idle to direct attention to the possibility of discovering a substitute. But as no reasonable limits can be set to the inventive genius of man, we do not know but some lucky inventor may soon hit upon a good cheap substitute, in which case no doubt his fortune will be made, and the community be the gainer.

Sulphur, its Nature, Supply, and Uses.

Sulphur is one of the sixty-two simple substances known to chemists. It is one of the most ancient, as well as the most peculiar elements of which this globe is composed. Its characteristics and applications are varied, curious, and useful. It is found in greatest abundance and nearly pure in some volcanic districts, but is scattered throughout the entire earth combined with other substances, such as in iron, copper and lead sulphurets and various sulphates like gypsum. Pure sulphur is of a pale yellow color, brittle, solid, and insipid; it is a non-conductor of electricity, and a bad conductor of heat. It fuses at 234 degrees, forming a transparent and nearly colorless liquid; as its temperature is elevated, its color becomes paler, until it reaches 482 degs. Fah., when it abruptly becomes dark brown, and in this last state is so thick as to flow with great difficulty. This change in its fluidity is not caused by a change in its density, as it continues to expand with its temperature. If it be thrown suddenly into water while in this condition, it forms a mass which remains soft and transparent for some time after it has become cold, and it may then be drawn into threads, which possess considerable elasticity, and is useful for making casts of medals. From a temperature of 500° to its boiling point—788°—it again becomes more fluid, and if allowed to cool gradually it passes down through the various conditions it assumed in rising, until just before freezing, when it again becomes *very* fluid. These are called "allotropic conditions," and together with its other qualities, have rendered it a subject of peculiar interest to chemists.

It has long been used in medicine, for tipping the ends of matches, and in making gunpowder; but its great and principal use is for the manufacture of sulphuric acid. Soda, which is so much used in the manufacture of glass and soap was chiefly obtained in Spain and France prior to the year 1800, paid about thirty millions of francs for its annual supply. During the war with England, this supply was cut off, and the price of soap and glass rose to a fabulous price, and manufactures suffered in consequence. A great prize was offered by the Committee of Public Safety for a new and cheap method of manufacturing it from common salt—which is composed of chlorine and soda, and Le Blanc, in 1804, invented the method at present pursued, of reducing it first to a sulphate by sulphuric acid, then into a carbonate with the carbonate of lime and coal, and in this state it forms the sal-soda of commerce.

To make soda from salt, it requires 80 lbs. of concentrated sulphuric acid to every 100 lbs. of salt, and it takes 100 lbs. of sulphur to make 300 lbs. of sulphuric acid. When we take into consideration how much is used in making soap, glass, and in bleaching, and for various other purposes, and that it is all made by the use of sulphur, the quantity consumed annually, by all manufacturing countries, must be enormous. And this is not the only great use of sulphuric acid: it is employed extensively in the refining of metals, making stearic acid from tallow and oils, and for various other purposes.

Quite a number of the chemical arts are dependent upon sulphur, not forgetting the india rubber manufactures; and were its supply cut off, soap, glass, bleached cottons, and stearine candles, would soon rise to exorbitant prices. *Hunt's Merchants' Magazine* states that about $20,000,000 worth of sulphuric acid is consumed in our country annually, and France and England consume four times as much. The importance of the sulphur trade is therefore apparent; a cheap supply of it is positively essential to every manufacturing country.

By late news from Europe, we learn that there is a speck of war in the horizon, and it may be that the fleets of England and France will soon blockade the shores of Naples and Sicily. From the latter country the chief supplies of sulphur are obtained, and a war with King Bomba may disturb the trade. We would, however, direct chemical manufacturers to a source of sulphur on this continent, where it can be obtained in as great abundance as in Sicily; that is, in the region of the volcano of Popocatapel, in Mexico. It has been throwing it up from great depths, and in a state of great purity for a number of years, and all the manufacturing countries of the globe might obtain a supply from it. The great expense attending it would be in its transportation through a mountainous region to the coast; but if enterprising Americans had the trade under their control, they would soon construct such roads as would render its carriage easy and cheap.

Were our supply of sulphur from Europe cut off or diminished, our manufacturers would have to look about for a supply from some other source, hence the necessity of directing them to other sources in view of such a contingency.

Curing Sea Sickness.

Dr. Nelkin, of this city who has served as surgeon on board of emigrant ships, has written a work on the subject of sea sickness, in which he states, that different persons are differently affected. The motion of the vessel disturbs the ganglion nerves of some, resulting either in dyspepsia, constipation or diarrhea. All of these ills are cured by the use of mucilaginous and aromatic drinks, or in obstinate cases, by opiates. When the pneumogastric nerves are affected, vertigo and vomiting are generally the results. To effect the cure of this most common and nauseous form of sea sickness, he tried various medicines, and at last selected morphine as the most efficient. He has used it with entire success for dizziness and vomiting. The common dose which he gave was half a grain twice per day. The relief afforded by this narcotic does not last over twenty-four hours; with the return of symptoms the morphine must be resumed. The position most favorable for relief is horizontal—lying on the back.

The most effectual way to cure sea sickness is activity and exposure on deck. This regimen requires the exercise of a determined will, because sea sickness tends to create a lethargetic state of mind, and a repugnance to physical exertion.

American Institute Prizes.

At the time of going to press the award of Premiums at the last Fair of the American Institute had not been made public.

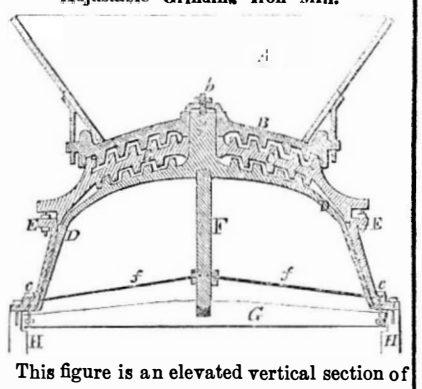
The Exhibition closed two weeks ago last Saturday, and there certainly can be no good excuse for this long delay in announcing to exhibitors the result of the Prize Committee's doings.

The Managers should be aware that exhibitors are impatient to know who have got premiums, and for what they are awarded, and if the Managers are half as solicitous to make the Institute popular among the exhibitors as we are, two serious mistakes made by them this year, we hope, will be in future avoided. The first was in not getting everything in the Palace in order before the doors are flung open to the public. The Managers should set a day on which the goods and machinery must be in their place, and not receive an article afterwards, and from that time let the Exhibition be open.

The second is in keeping the exhibitors and the public so long in suspense as to the result of the awarding committees.

General satisfaction has been expressed in regard to the Exhibition and the Management, and, after correcting a few mistakes, the American Institute Fairs cannot be excelled by any in the world. The receipts this year amounted to $27,610, and have exceeded the expenses by $5000.

Adjustable Grinding Iron Mill.



This figure is an elevated vertical section of a cast-iron mill for grinding grain. It is adjustable and adapted for grinding shelled and cob corn, hominy, oats, &c. A is the hopper; it is secured to the cap wheel, B, by metal straps. The levers for the horse to turn this mill are inserted through lugs in this cap wheel which has teeth or projections on its curved arms extending from its center boss. C is what is termed *a regulator*. It has arms extending from its center, on which there are teeth, and its shell extends down on the outside, and is firmly bolted to the box, H. D is a cast-iron burr; it is formed with a convex top on which are teeth or projections, and its outer sides have grinding projections; also grooves coinciding with like grooves and projections on the inner surface of the shell of C. The burr is of a conical form—dome-shaped. The cap wheel, B, is secured by a nut, *b*, to the neck of the burr spindle, F, so that they both revolve together, grinding the corn between their corrugations and those of the toothed regulator, C. As the burr is conical, the screw bolts EE, regulate, the distance of the space between it and the shell of the regulator, to grind the feed coarse and fine as may be desired.

The spindle of the burr is plumbed or trued by four screw rods, *f f*—two are shown. G is the bridge tree. The cobs or shelled corn being fed into the hopper, they are first crushed between the top projections, and thus the grinding has not all to be performed on the sides, as in some other mills; the sides of the mill do the fine grinding, and thus the operation goes on in a gradual and uniform manner from first to last. The plumbing rods, *f f*, set all the grinding surfaces true to one another; and as all cast-iron mills are liable to warp, and thus cause the dress or grinding surfaces to wear untrue, and wear out quick, this method of regulating the position of these surfaces is an excellent compensation improvement.

This mill is simple, strong, durable, and not liable to get out of order. Patented Dec. 25, 1855. For more information. address the patentee, Thos. B. Stout, Keyport, N. J.

Telegraphing under Water.

Electricity is a curious agent, influence, or call it by what name we please. It runs along metal wires and writes away from New York to Washington quick as thought. But just break its frail metal road, and put a handsome silk cord of half an inch in length in place of half an inch of the wire, and lo he will not walk on it a hair's breadth; down goes his writing pen, and if he refuses to walk on silk, he is not slow in going into the *sulks*.

A very peculiar feature of electricity, in connection with submarine telegraphing, was discovered by Faraday, shortly after the telegraph cable was laid down between England and Holland. At first it would not operate; and as it was a well constructed cable—carefully insulated and laid out, the difficulty was unexpected, and could not be accounted for. Faraday was consulted, and he found that the conducting property of sea water on the outside of the coated wire converted it into an elongated Leyden jar, and caused it to retain a portion of the charge, in the same manner as an ordinary Leyden jar retains a part of the electricity after it has been discharged. This difficulty, in which the electric current traverses continuously in the same direction was overcome by reversing the direction of the current after each signal, by which process the wire was prepared to transmit another. That plan has answered from London to the Hague, and no doubt will be effectual to transmit news from New York to London.

Crediting News.

The *Boston Herald*, of the 3rd inst., in an editorial, gives rather a curious reason why so many articles are copied from our columns without credit, viz. that we *lead* all of our articles, and that other papers do not know whether to give us credit or not, because it is a custom with other papers *not to lead* copied articles. The Editor therefore requests us not to lead the small articles in our columns that we copy from other papers. Really we do not see into the philosophy of this request, nor into that upon which the article is based. When we copy an extract from another paper, we put it in inverted commas, whereby every person acquainted with literature can understand its authority. There is no paper more ready to give credit to other sources of information than the SCIENTIFIC AMERICAN, but nearly all our matter is entirely original. The editor of the *Herald* may rest assured, that it is a positive fact, that almost *every one* of the notices of new American and foreign inventions which appear in various papers, are taken from our columns: "Hardly a day passes but we are greeted, in the papers, with some re-hash of an old article on 'very recent' discoveries, the original particulars of which appeared years ago in our journal."

SPLENDID PRIZES.—PAID IN CASH.

The Proprietors of the SCIENTIFIC AMERICAN will pay, in *Cash*, the following splendid Prizes for the largest Lists of Subscribers sent in between the present time and the first of January, 1857, to wit

For the largest List,	$200
For the 2nd largest List,	175
For the 3rd largest List,	150
For the 4th largest List,	125
For the 5th largest List,	100
For the 6th largest List,	75
For the 7th largest List,	50
For the 8th largest List,	40
For the 9th largest List,	30
For the 10th largest List,	25
For the 11th largest List,	20
For the 12th largest List,	10

Names can be sent in at different times and from different Post Offices. The cash will be paid to the order of the successful competitor, immediately after the 1st o January, 1857.

☞ See Prospectus on last page.

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Printing Textile Fabrics in Great Britain.

The following is condensed from a lecture lately delivered before the Society of Arts, London, by Joseph Burch :—

Calico printing was early practiced in India, but did not find its way to England until 1690, when a small printing factory was established on the river Thames near Richmond by a Frenchman. Soon after this such factories multiplied in the neighborhood of London. The printing was then performed entirely from wood engraved blocks of small size, and the operation was done by hand. The printer registered the block, and laid it down carefully on the cloth with his left hand, and then struck it a tap with a mallet. The first great improvement made in this art was by A. Bell, in England, in 1785, and was called the "cylinder machine;" it consisted of engraved rollers which impressed the cloth. The same principle of printing is now applied to newspapers and books.

Printing from engraved rollers by the cylinder machine has, in consequence of the great speed with which they deliver their impressions, become the ordinary method for producing cotton prints. The rapidity with which this really beautiful machine turns off, with unerring exactness, piece after piece, its miles of printing per day, is truly wonderful. Although it cannot accomplish the fancy styles of topical printing with that perfection which surface printing effects, yet to the cylinder alone is due the extraordinary cheapness of cotton prints.

In the year 1846 Bennet Woodcroft, now of the London Patent Office, invented the pneumatic process of printing deoxydized indigo in an artificial atmosphere, an invention which ranks amongst the greatest achievements of chemical science as applied to calico printing, and was successfully applied to the cylinder machine by Messrs. Hoyle & Co., of Manchester. It is known that in a gas, such as a common coal gas, the deoxydized indigo will remain liquid for a length of time, and only while in this state is capable of being absorbed by the cotton fiber, for as soon as the indigo takes up the oxygen it is instantly precipitated, and then no longer gives out its color. In order to preserve it in a liquid state after its application to the cloth, Mr. Woodcroft contrived a chamber, filled with coal gas, into which the cloth was passed at once from the machine, and where, after traveling over several rollers, the indigo was deposited. During its movement through the chamber the indigo remaining liquid was entirely absorbed by the capillary tubes of the fiber, and thus a depth of shade almost approaching to a black was produced from a color which, if printed in the ordinary way, would have been little more than an azure blue. The process, too, was completed in much less time than that usually required.

Shading in stripes has been very successfully performed by the cylinder machine from engraved rollers. This is done by mixing the different tones of color upon endless sieves before the color is applied by them to the roller, which afterwards, by the assistance of the "doctor" on its surface, completes the more perfect gradation and mixture of the tints.

The printing of woven carpets is a recent and novel application of the art. In operating on plain velvet pile and terry goods it is necessary not only to print the surface or end of the pile, but to cover the whole depth of it with color. The dimensions of the design are generally far beyond the ordinary size of common printing blocks, and the variety of shades of color required to work them out, renders the employment of powerful and accurate machinery a matter of absolute necessity. Mr. Burch uses a series of strong block-printing machines for this purpose.

The blocks employed for the printing of carpets are of greater dimensions than ordinary blocks. The largest used at present are 56 inches long by 27 inches wide. These blocks are prepared in the following manner :—

The design is transferred to checked or point paper, as designs for weaving are prepared. In like manner the surfaces of the printing blocks are prepared, by cutting them in lines each way, so as to form checks of a corresponding number of squares all over the surface, each block being made a fac simile of the others. This is done without any reference to the design. It is then only necessary to mark those squares on each block which represent on the point paper the particular color in which that block is to work. These squares are afterwards left in relief by removing the intermediate parts. Each block thus carries on its surface certain portions of the design, every colored square on the point paper being represented by the corresponding square on one or other of the blocks. The color is not furnished from flat sieves, but from rollers. Each section of the apparatus works with two blocks, which deliver their impressions on one table, taking up their color in passing to and fro over the color rollers as they are moved laterally by the traversing frames, where they are placed on springs, which raise them after they have been forced down upon the carpet. In the construction of the machinery very great accuracy is necessary to insure correct work. After the carpet is dried it is taken to the steam-box, in which it is hung for two hours, and subjected to the action of steam at considerable pressure.—This softens the colors and fixes them to the fabric, and is analogous to the boiling operation in the process of dyeing. The carpets are afterwards washed by machinery for two hours, to remove the superfluous parts and the thickening of the colors. They are then dried, dressed, sheared, and finished for the market. They are woven by a power loom, Sievier's invention, which raises the pile without the use of a wire.

Manchester and Glasgow are the two great cities for printing textile fabrics. Mr. Burch says of them :—

"The Glasgow printers are ahead of their competitors. Many circumstances have conspired to this. If there be any new process or machine, inquire for it in Glasgow; you will not find it in Manchester. Manchester desires no improvements; is content to jog on in the old track. Glasgow seeks and encourages novelty. If quantity alone is wanted, it is to be obtained in Manchester: but if quality and quantity are required, we must go further north. The delaine trade, the handkerchief trade, the shawl trade, and the muslin trade, are now principally in Glasgow hands, and they do them well."

It is a fact which cannot be doubted, that those manufacturers that are always on the alert for new improvements, and who patronize new inventions keep the lead of all others, just as Glasgow now leads Manchester.

Lord Palmerston and the Cort Family.

Mr. David Mushet writes as follows to the *Mining Journal*, respecting the movement now in progress for raising a fund for the descendants of Henry Cort, the great improver of the iron manufacture :—

"I may refer with great respect to the courtesy, accessibility, and kind consideration evinced by Lord Palmerston since this case was first submitted to him, and further shown by his lordship's grant, last week, of a pension to Mr. Richard Cort. It is true, the amount is small, and it can only be considered as a preliminary installment. But this acknowledgment of the claims is the more gratifying, and shows the entire goodwill of his lordship in duly appreciating the case, because he had previously expressed his fear that it would be utterly impossible, out of the very small yearly sum placed at the disposal of the government of the British empire for the reward of merit, and the numerous immediate demands on it, to spare any portion for the Cort family. His lordship's deed has, therefore, proved better than his word. It is no small satisfaction to possess a Premier who has reversed the old adage of the unperformed promises of statesmen.

"I think it also a very incumbent duty in this prosperous position of the case, to express the sense of gratitude which all right-minded Britons must feel to the editor of the Scientific American, for his cogent remarks upon the Cort miracle, on Dec. 15th last, and in subsequent numbers. A more energetic appeal was never put in print. The voice which was then heard resounding across the Atlantic has proved no small aid in our efforts to awaken the British mind from its deep and strange mesmeric sleep regarding the author of inventions 'now used in manufacturing bar iron in every civilized country under the sun. All nations are his debtors; the benefits conferred on them by his inventions are beyond calculation.' I sincerely trust no Englishman may ever forget to do equal justice to American inventors, especially when visiting the shores of their ancestors, under the sacred claims of hospitality."

Iron Frames for Vessels.

The Philadelphia *Ledger* says :—Seven years since a steam propeller was built at the Penn Iron Works of Messrs. Reaney, Neafie & Co., which was most appropriately named the *Novelty* from the peculiar mode of its construction. The hull was built on a plan invented by Capt. R. F. Loper, dispensing entirely with timber in the construction of her frame, and substituting iron. These ribs were corrugated in their center to increase the strength, and had flanges on either side, with holes drilled for the purpose of securing the timber by means of screw bolts. The *Novelty* was completed, and has ever since been in use on the transportation line between this city and New York. The experiment has been a most decided success. The annual outlay for repairs has been much less than required by vessels of the ordinary construction. She is now considered as good as new, and would be ranked by underwriters as A No. 1, while steam vessels constructed at the same time wholly of timber, and used in the same trade, have so much deteriorated that their steam machinery has been removed, and the hulls are now used as barges only."

Cold Regions Extending.

It is well known as a matter of history that when Greeland was discovered it possessed a much warmer climate than it does at present. The ice-packs have been extending south from the polar regions for some centuries, and the north-east coasts of our continent are now much colder than they were three centuries ago. The cause of this is not well understood, the fact only is known. It is believed by some persons that there is a great eddy in some part of the polar ocean which sometimes changes its direction, and by drifting large icebergs from one place to another change the climate of those places whence they are drifted by the presence of such masses of ice diffusing their low temperatures to great distances.

In the month of July last the White Sea was blocked up with huge mountains of ice, and the commerce of Archangel stopped—something which never happened before. In the Faroe Islands snow fell in the valleys in the middle of July, the like of which also never happened before. If this drift of ice continues regularly for a few seasons the coasts of the White Sea will become as inhospitable as those of Greenland now are.

Paper from Moss.

Dr. Terry, of Detroit, Mich., who has been experimenting on half a tun of moss obtained in Lake Superior region, according to the Cleveland *Plaindealer*, affirms that it makes beautiful white paper without any peculiar process. The moss is represented to exist in great quantities on Isle Royal, and several other localities in the vicinity, and can be procured at a very moderate cost.—[Exchange.

[There is no difficulty in obtaining plenty of cheap materials from which to manufacture paper. The great question is one of cost in the manufacture.

The common grasses, wood, and other vegetable substances that have been experimented with, cost so much to reduce them to pulp, remove their natural gum, and to bleach them, as to render paper made from them more expensive than that from rags.

Aluminum Becoming Cheaper.

The *Builder* (London) states that this metal which a short time since was nearly as dear as gold, has already become cheaper than silver. Tea and coffee pots, spoons, &c., made of it are to be seen in the jeweller's shops of Paris.

Blowers for Cooling Boiler Rooms.

The boiler rooms on board of steamships are like bakers' ovens, and the life of a fireman on them is most laborious and exhausting. Any useful improvement to keep the boiler rooms cool would be one of the most humane inventions that could be introduced into steam navigation. We learn by the London *Mechanics' Magazine* that Charles Wye Williams, of Liverpool—author of a work on boilers and the combustion of fuel—has taken out a patent for employing fans operated by a small auxiliary engine, not only to promote draft in the furnaces when required but to ventilate every room, especially the boiler rooms on steamers. Such an application of the blower or fan for ventilation should be adopted by every steamer, and it would pay, we think, to be applied to California sailing vessels to prevent sweating between decks, which is the cause of so much injury to goods shipped from this port to San Francisco. This principle of ventilation is common property; all that is covered in England by Mr. Williams' patent, is the particular means he employs for regulating the amount of draft—the currents—by pipes and valves.

Velocity of Air in a Vacuum.

Air rushes into a vacuum at the surface of the earth with a velocity of 1338 feet per second. This is the same velocity with which steam rushes into a perfect vaccum in a condenser. According to the perfection of the vacuum so will be the rapidity of the exhaust; thus, if the vacuum be only 13 lbs., instead of 15 lbs., then the velocity of exhaust will only be 1137 feet per second. The quick condensation of steam in a vacuum is therefore necessary to the efficiency of a condenser; Scott Russell, in his work on the steam engine, asserts that a vacuum may sometimes be too good, and attempts to prove his point, but his proof is equally good against the use of a vacuum upon any consideration.

The velocity of the air rushing into a vacuum, is computed from its known weight or pressure of 15 lbs. on each square inch at the earth's surface. A homogeneous atmosphere of the same density throughout as at the earth's surface, extending 27,818 feet high, weighs this much, therefore a body falling from this hight acquires the velocity of 1338 feet per second. This law is equally applicable to the falling of water.

Epidemic Among Fish.

A curious phenomenon has just exhibited itself among the finny tribe in some of the rivers of Michigan. It is announced that during the past month the shores of Grand river have been strewed with dead and dying fish of unusual size. The same epidemic prevails in the Shinaase. This is the second time during the present season that the waters of these streams have been thus scourged. A few months ago every form of creeping thing known to that country was cast dead upon the banks, in great numbers. Lizards of enormous size and offensive appearance were piled in heaps where they were thrown by the eddying current. Rats, snakes, and almost every species of slimy monster shared a like fate. Now, however, the disease is confined to the fish.

Steam Accident.

On the night of the 31st ult. while the large steamboat *Bay State* was proceeding on her trip from this city to Fall River, the huge walking-beam of her engine broke at the center, the head of the cylinder was crushed, and the steam rushed out, instantly killing a little girl who was looking at the engine, besides severely scalding several other persons.

The boilers and engine-rooms of all our steamers are too much exposed. They should be formed into bulkheads enclosed in plate-iron. Were this improvement to be carried out on steamboats, many accidents would be prevented. Such an accident as the above very seldom happens, however.

Heating with Air.

Air and gases are very imperfect conductors of heat, which appears to diffuse through them as in liquids, the heated molecules ascending as they become rarified; hence the true philosophy of admitting hot air to rooms at the lowest part of the floor.

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E. S., of Ga.—The bitumen may be poured upon your roman cement floor, if the latter is perfectly dry; but if it is not, steam will be generated, and the bitumen will not adhere. It will require about one and a half inches of bitumen run on the floor. The sand to mix with it must be roasted to expel all the moisture, and the quantity judged of by the thickness of the mixture—just use such a quantity of sand as will allow of the compound being laid on freely, like thin mortar. Boil all thoroughly and sprinkle half an inch of dry white sand on the top, and beat it well and smoothly down. When perfectly cool, sweep off the loose sand. You can paint it when cold and hard and it will make a good floor.

O. T. M., of Mass—If you coat stove pipes with plaster of Paris, made into a liquid form with a weak solution of alum, the radiation of heat will be prevented. You perhaps want a black varnish for this purpose; we do not know of any such.

A. E, B., of Ala.—An over-shot water wheel is propelled by the weight of the water; this is the only motor propelled by direct weight. To give you all the information you request, would occupy too much space in our columns.

R. F. K. of Phila.—The same composition that would remain hard in moist earth, might soon disintegrate in a running stream of water. Plaster of Paris castings are not very durable, nor can they be rendered fit to withstand the effects of running water for any length of time. If you soak them in boiled linseed oil, then dry them thoroughly, and afterwards coat them with a solution of glue and boil them in a solution of sulphate of copper and the oxyd of manganese, we believe you will render them fit to withstand exposure in moist earth, if not in running water. The sulphate of copper forms an insoluble salt in the presence of an excess of oxygen, which is obtained from the manganese.

W. D. S. of Va.—We do not know the prices of those engines. Address the parties named in the notices.

D. N. B., of Me.—The article of machinery oil advertised by Mr. Pease, of Buffalo, in [another column, we have the most perfect confidence in as being the best article for the cost there is in the market as a lubricator. As a burning compound we have had no practical illustration of its merits, but it is highly recommended for that, by multitudes who have used it.

F. G., of N.Y.—There are a number of parties making the Woodworth planing machine. John Gibson, of Albany, will furnish you as good a one as any other concern, and we presume quite as cheap. See his advertisement in another column.

J. B. of Pa.—Grate bars have been made open at the bottom to allow sufficient air to pass to keep them cool, and by rounding them on the top, to prevent cinders from readily adhering to them.

The Scientific American can be procured of Sampson Low, Son & Co., Ludgate Hill, London. They are our English Agents.

G. B., of Ind.—We have examined the sketch of your alleged improvement in smoke-consuming stoves. Your idea, if we understand it correctly, is to dispense entirely with the chimney, and consume all the smoke. This is impracticable, as carbonic acid, which is the product of all perfect combustion of carboniferous fuel is a perfect fire annihilator. There is much combustible matter in smoke, but you must get rid of the products of such combustion.

J. B. S. of Conn.—If you will refer to the history of reaping machines, published in Vol. 9, Sci. Am., you will find that rotary cutters have long been known. They are considered inferior to the kind in ordinary use.

A. J. Thompson, Phenix, Pa., wishes to procure a machine for filing handsaws, that can be depended upon for utility.

C. S., of Mass.—Your opinions respecting the defects of seed planters and drills may be correct, but you ought to have specified and pointed out those defects. A general opinion, you know, is like a random shot; it cannot be expected to hit the mark.

H. K., of Ohio—You can make a screw propeller as small as you please for a canal boat, and give it a velocity according to the speed you wish to attain. If it is 2 feet in diameter, and you wish to attain a speed of 6 1-2 miles per hour, give it 100 revolutions per minute. This will allow 11 per cent. for slip.

J. E., of Mich.—By addressing Hon. Chas. Mason, Commissioner of Patents, you can procure, in all probability the seeds you want.

L. J. R., of Ohio—Get Minifie's large book on drawing You will find it to be the best you can use as an elementary work.

J. P. A., of N. Y.—You had better correspond with E. L. Norfolk, of Salem, Mass., in regard to a portable grinding mill.

A. A. of Md.—If you will advertise in one of the daily papers in Baltimore, for a second-hand steam engine, you will be very likely to find one; we do not know of one for sale of the size specified. The honey receipt we do not endorse. As a syrup it may do very well, but as an article equal to honey it is absurd to entertain such an opinion.

W. McC. of R. I.—We could not devote so much space as we could have wished in describing the printed goods at the Fair. We did not and could not make invidious comparisons. The goods of Messrs. Dunnell were excellent, and not surpassed, if equalled, by any on exhibition Could you not furnish us with some particular information relating to Calico Printing in our country?

D. R., of N. C.—Write to D. W. Messer, of Boston, respecting the manufacture of cotton seed oil.

E. S. E. of N. Y.—Robertson Buchanan's paddle wheel s illustrated on page 128, Vol. 5, Sci. Am.

M. C., of Conn.—You must bear in mind that railway station indicators are not new; several have been proposed. Mr. Davis does not claim the endless apron which carries the names of the station upon it. He only claims some peculiar mode of operating it which is new.

R. W. of N. Y.—The putty used for putting in the glass of windows, is for making a close joint. The glass can easily be secured without it. Those who manufacture magic lanterns, paint the dissolving views, we suppose.

R. W. Sharp, of Montgomery, Ala.—Wishes to get a machine for cutting shingle blocks in about 18 inch lengths.

S. Y. of N. Y.—We are glad you have received your patent. and we thank you for your complimentary remarks on our mode of doing your business. We will endeavor to serve any of your neighbors and friends who entrust us with their business, as faithfully as you flatter us in having done yours.

D. W. G. H., of Me.—a re-issue can be applied for at any time during the existence of the patent. The assignments do not make any difference. The manufacturer can use any part of his machine upon which he has a specific claim, without reference to the other claims.

Money received at the Scientific American Office, on account of Patent Office business for the week ending Saturday, Nov. 8, 1856:—

H. M. of N. Y., $25; J. L. of N. Y., $55; M. C. R. of O., $32; J. A. of N. Y., $30; T. M., of Pa., $40; H. M. of O., $25; M. & H. of Ga., $55; L. S. of Conn., $25; J. C. Jr. of Conn., $25; B. & P., of Wis., $25; L. K. S. of Conn., $35; N. L. of N. J., $25; J. B. W. of N. Y., $100; G. W. B. of Vt., $30; W. L. of N. Y., $32; J. B. of Pa., $25; T. F. St. J. of N. Y., $30; H. K. of Mass., $30; K. & W. of Ind., $30 J. S, B. of N. H., $30; T. C. of Mass., $30; T. H. of N. J., $25; J. A. of N. Y., $30; W. W. of N. Y., $20; F. H. of N. Y., $25. S. E. T. of L. I., $25; W. C. of L. I., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Nov. 8:—

W. W. of N. Y.; H. M. of O.; H, M. of N Y.; D. W. of N. J.; F. H. of N. Y.; E. M. of N. Y.; W. P. F. of La.; J. C. Jr. of Conn.; J. E. T. of L. I.; N. L. of N. J.; B. & P. of Wis.: W. C. of N. Y.; L. S. of Conn.; F. D., of Paris.; J. D. S. of O.; T. H. of N. J.; J. L. of N. Y.; T. F. St. J. of N. Y.

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Private consultations respecting the patentability of inventions are held free of charge, with inventors, at our office, from 9 A. M., until 4 P. M. Parties residing at a distance are informed that it is generally unnecessary for them to incur the expense of attending in person, as all the steps necessary to secure a patent can be arranged by letter. A rough sketch and description of the improvement should be first forwarded, which we will examine and give an opinion as to patentability, without charge. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country.

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NOTICE—All persons in the United States having patented inventions for sale, are promptly requested to call or communicate with the subscriber before the 1st of December, when they will receive (free) information of very great importance. R. D. GOODWIN, 9 2* No. 712 Broadway.

TO FANNING MILL MAKERS—Lewis & King, Seneca Falls, N. Y., manufacturers of a superior article of Fanning Mill Irons, are now prepared to make arrangements for supplying castings on the most reasonable terms for the year 1857. 9 9*

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Grand Blanc, Genesee Co., Mich., Sept. 13th, 1856.
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ECHOLES' PATENT HYDRAULIC ROCK DRILLING MACHINE, illustrated in the Scientific American of April last, and which took the Gold Medal last year, at the great Fair of the American Institute, (Crystal Palace,) are now manufactured and for sale by us. Price for the usual size for ordinary drilling $100. DARLINGTON & CO., Room 17, N. H. Depot, corner of Centre and Franklin streets. 8 4*

A NEW AND SCIENTIFIC INVENTION—Dr Cheever's Galvano-Electric Regenerator. Patent issued Jan. 15th, 1856. A circular relating to the use of the instrument, embracing a general treatise of atony of the spermatic organs, the result of which tends to softening the medullary substance of which the brain is composed may be had gratis, and will be sent to any address by mail by their indicating a desire to receive it. All letters should be directed to DR. J. CHEEVER, No. 1 Tremont Temple, Boston 8 4*

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Science and Art.

Artesian Wells on the Western Plains.

In our last volume we noticed the efforts that had been made, in 1855, by the U. S. Corps of Topographical Engineers under Capt. Pope, to sink artesian wells in the Western wilderness of Llano Estacado. An article in the New Orleans *Picayune* gives some account of his labors during the past season. It says,

"In sinking the wells Capt. Pope found no difficulties in the geological formation. This is entirely composed of alternate strata of indurated clay and cretaceous marls of every variety of color, easily bored through, but sufficiently hard to prevent the walls of the boring from falling and incommoding the labor.

The first stream of water was struck at a distance of 360 feet, and it rose to the hight of 70 feet in the tubing. Continuing the labor, through the same formation, the second stream was struck at a depth of 641 feet which rose 400 feet in the well, or about 50 feet higher than the first stream. These labors demonstrated the existence of water streams beneath the surface, but as winter was approaching, and the material which he had brought having been exhausted, Capt Pope went into winter quarters on the banks of the Rio Grande.

Having received fresh supplies in the spring of the present year, he returned to Llano, and in April last resumed his labors there. His former attained results having demonstrated the existence of abundant water beneath the surface, he went five miles eastward from the first well and there sunk the second. In the prosecution of this work he struck the same stream that he had found in sinking the first well, and on reaching a depth of 860 feet, he encountered another which rose 750 feet in the tubing.

Through the absence of water the Llano Estacado forms a complete barrier to travel between the western towns of Louisiana and Arkansas to New Mexico and the Messilla Valley, along the line of the 32nd parallel, by a route which is some hundred of miles shorter than any other. It is covered throughout with grama grass, which is one of the most nutricious of the grasses for cattle, and which has the greater advantage that it is not killed by the cold of winter, affording abundant pasture all the year round. Fuel, too, is everywhere obtained with great ease in the mosquite root. This is a remarkable root, and might be more properly termed a subterranean forest. Its stems penetrate the earth to a distance of seventy feet in depth, with ramifications similar to the branches of trees, and with a clear and hard wood stem from five to eight inches in diameter."

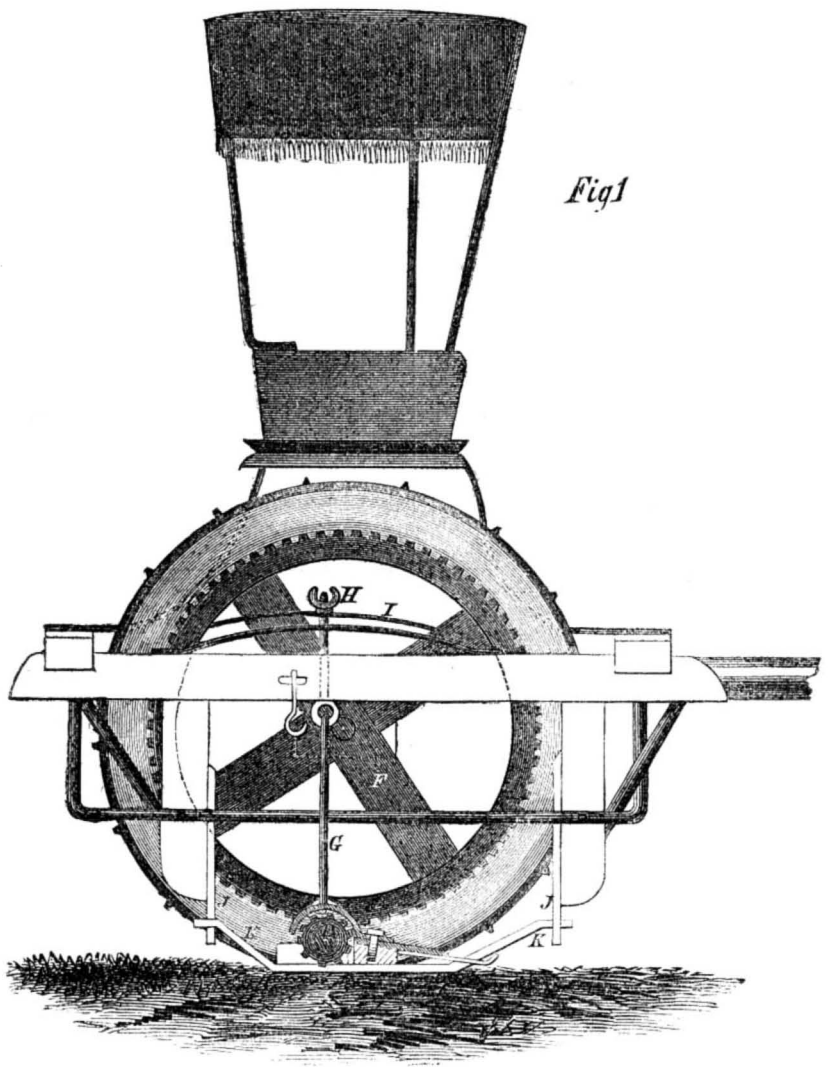
Manufacturing Ice.

This is rather a cool subject at this time of the year, winter being at hand, but not the less interesting on that account to the vast majority of the population of this globe. For cooling beverages, and preserving meats, and various kinds of fluid, nothing is equal to ice. It is one of the most desirable necessaries and luxuries of life in warm climates, hence we have received letters expiating on the benefits that would be conferred upon those dwelling in our Southern States by the invention of some machine, or the discovery of some new process by which ice could be manufactured at any place and in any season; and we have been informed by some of our southern subscribers that if it could be produced artificially for five dollars a tun the invention would come into very general use. A few weeks since it was stated in our columns that there was a machine in operation at the Sheboygan Works, Cleveland, Ohio, which manufactured ice for about this cost.—We stated to a correspondent who had made inquiries of us respecting this machine, that if cooling chemical mixtures were required in the process we did not believe ice could be produced by it thus cheap.

We have received a letter on this subject from E. T. Sterling, of Cleveland, Ohio, who says it is a very simple machine, and although chemical mixtures are employed to reduce the temperature of the water to be frozen, yet ice can be made by it for less than five dollars per tun.

We really hope that this ice machine is a success, still it is our opinion that the process must be expensive. It is well known how to make ice artificially, but to do so economically has been the great obstacle to its usefulness, for unless ice can be manufactured in any place as cheap as natural ice can be sold, then it is of no benefit whatever. The expense for the refrigerating chemicals to be used in making a tun of ice cannot be small. Two or three barrels of salt must be required for every tun, and to this must be added the expense for operating the pumps. Positive minute information on these heads would be of interest to our southern readers, who are deeply interested in such an invention. Will Mr. Sterling furnish them?

GIG TOP HARVESTERS.



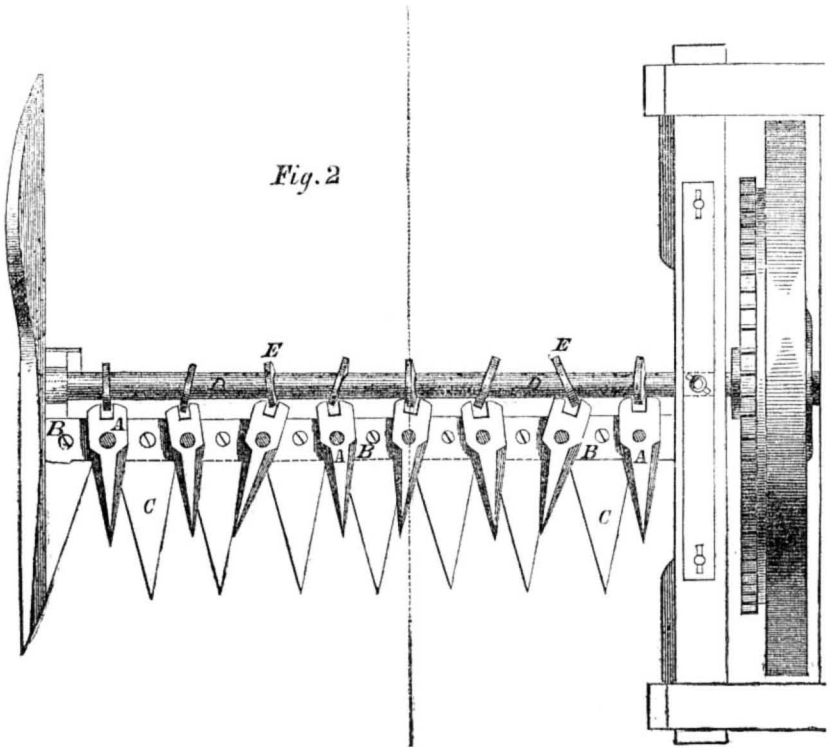
New Harvester.

Our engraving illustrates an improvement in mowing and reaping machines, patented Sept. 2nd, 1856, by Oren Stoddard, of Busti, Chautaque Co., N. Y.

The invention consists, principally, in a peculiar method of operating the cutters, whereby they are made to cut separately and in succession, instead of all simultaneously, as in other machines.

An improvement is also made in the mode of attaching the cutter bar to the machine, whereby the cutters rise and fall in conformity to the surface of the ground, or when impediments are in the way. The cutters may also be raised at pleasure. Fig. 1 is a side elevator, and fig. 2 a top view.

A are the cutters which move independently, and are separately pivoted to the bar, B. C are the stationary fingers, arranged as usual. The cutters, A, are made to move back and forth across the surfaces of C, and thus clip the grass, like shears. The cutters are moved by means of small cams, D, which are attached to shaft E. It will be observed that cams D are all arranged at different angles, so that when they revolve no two of the cutters will be in the same position at the same time. The resulting effect is, that the power required for cutting is gradually applied and evenly distributed through the cutters. In other machines the cutters all act on the grass simultaneously, for they all have the same angle, and are all moved alike. The power for cutting is thus applied suddenly with a jerk, and ceases in the same manner. This inequality of motion is alleged to be injurious, both to the horses and to the machine.



Shaft D is rotated by the large driving gear wheel, F. The inner end of the cutter bar is hung, in part, upon rod G, whose upper end rests upon the elliptic springs, I. These springs impart a certain degree of elasticity to the cutter bar, B, to enable it to pass over obstructions easily, etc. The length of rod G is adjusted by set screw H.

The inner end of bar B is also swung or pivoted to the pendants, J, by means of strap K, so that when desired, the outer end of bar, B, with cutters, may be turned up, and the whole lifting apparatus lifted from the ground. The various improvements named are crowned by furnishing the driver's seat with a gig top which affords protection from the scorching rays of the summer's sun.

The inventor states that this harvester is drawn by one horse with as much ease, and will do as much work as many of the ordinary two horse harvesters. It works equally well whether drawn at a slow or a quick pace. Weight of the machine, 360 lbs. Price $80. By detaching the mechanism, the gig part can be used for a vehicle of that class. Address the inventor as above for further information.

A cotemporary states that 300,000 persons are employed in France in the manufacture of window blinds from printed muslins.

MECHANICS

Inventors, and Manufacturers

TWELFTH YEAR

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